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B Plant Aggregate Area Management Study Technical Baseline Report

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ACRONYMS

amsl	above mean sea level
BHI	Bechtel Hanford, Inc.
c/m	counts per minute
DOE	U.S. Department of Energy
HWSA	Hazardous Waste Storage Area
ICF KH	ICF Kaiser Hanford
ITS	In-Tank Solidification
NEPA	*National Environmental Policy Act*
PNL	Pacific Northwest Laboratory
PUREX	plutonium-uranium extraction
REDOX	reduction and oxidation
RL	U.S. Department of Energy, Richland Operations Office
TBP	tributyl phosphate
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TRU	transuranic
UPR	unplanned release
VCP	vitrified clay pipe
WHC	Westinghouse Hanford Company

1.0 INTRODUCTION

This document is prepared in support of an Aggregate Area Management Study of B Plant, 200 East Area, at the U.S. Department of Energy's (DOE) Hanford Site near Richland, Washington. It provides a technical baseline of the aggregate area and results from an environmental investigation undertaken by the Technical Baseline Section of the Environmental Engineering Group, Westinghouse Hanford Company (WHC), and by EBASCO and Hart Crowser, providing support under contract to WHC. This document is based upon review and evaluation of numerous Hanford Site current and historical reports, drawings and photographs, supplemented with site inspections and employee interviews. No intrusive field investigations or sampling were conducted.

This document was written in 1991 and has been edited for publication as a Bechtel Hanford, Inc. (BHI) document to allow the information to be referenced in current documents. Some information identified as current, as of 1991, may not be current as of 1995 because of changes in mission, scope, plan, or political climate.

Most of the historical documents from which data was extracted for this document provide dimensions in nonmetric units of measure. In the interest of accuracy, data is reported here as it was provided in reference documents and no conversions to metric are provided.

The B Aggregate Area is made up of 13 operable units; 200-BP-1 through 200-BP-11, 200-IU-6, and 200-SS-1 that consist of liquid and solid waste disposal sites in the vicinity of, and related to, B Plant operations. Figure 1-1 depicts the location of each operable unit.

This report describes B Plant and its waste sites, including cribs, french drains, septic tanks and drain fields, trenches and ditches, ponds, catch tanks, settling tanks, diversion boxes, underground tank farms designed for high-level liquid wastes, and the lines and encasements that connect them. Each waste site in the aggregate area is described separately. Close relationships between waste units, such as overflow from one to another, are also discussed. Photographs are provided in Appendix A.

An environmental summary for this aggregate area is not provided here. An excellent summary may be found in *Hanford Site National Environmental Policy Act (NEPA) Characterization*, which describes geology and soils, meteorology, hydrology, land use, population, and air quality (Cushing 1990).

Appendix B contains a list of photographs and selected technical drawings for the operable units discussed in this document. Appendix C contains a listing of the technical library holdings of both Ebasco Services and Hart Crowser pertaining to the Hanford Site and southeastern Washington. Appendix D contains the TRAC Database - Tank Farm Summaries for the 241-B, 241-BX, and 241-BY Tank Farms.

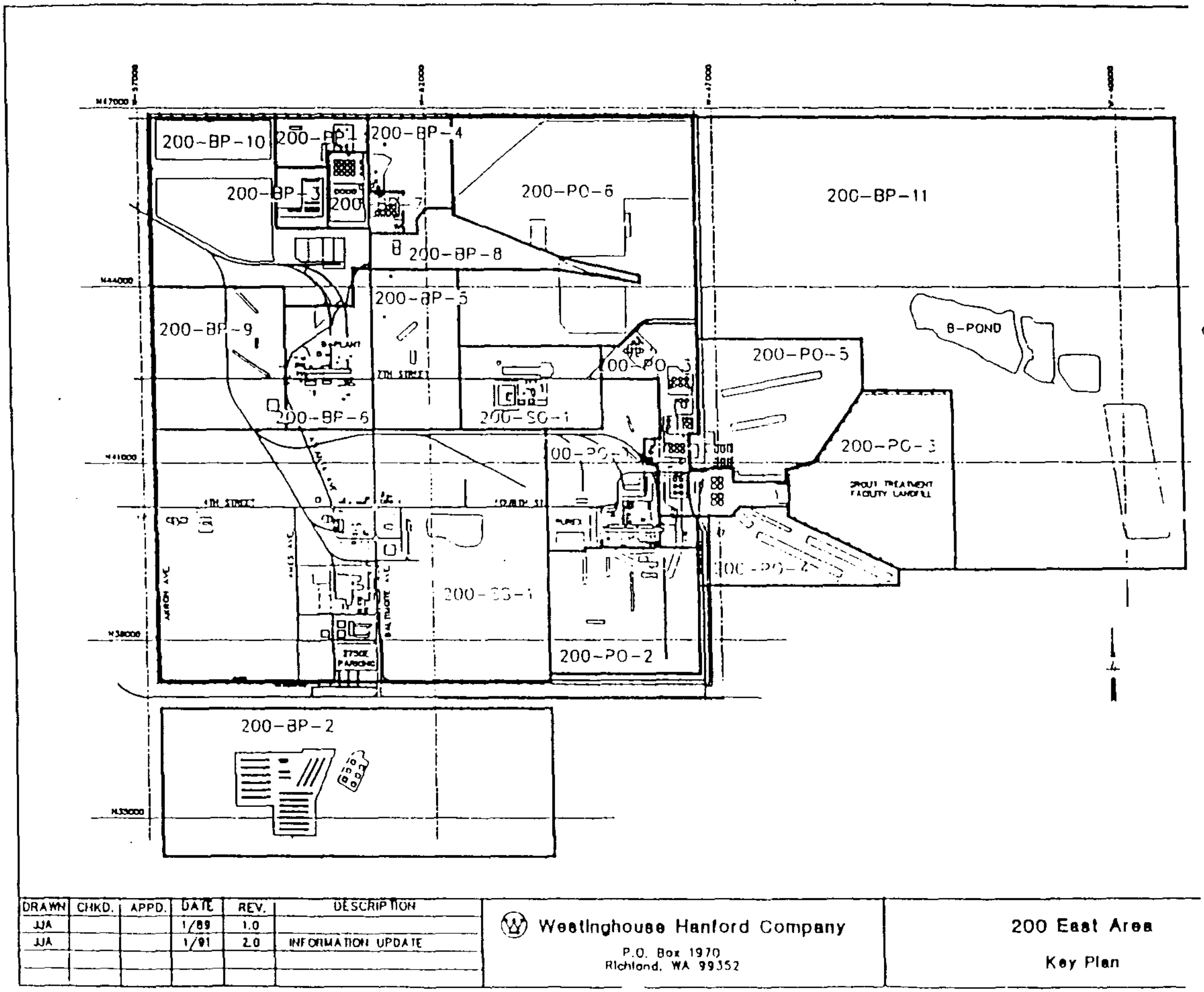


Figure 1-1. 200 East Area Site Location Map.

While some improvements were incorporated that effected minor waste volume reductions, the first significant development occurred in February 1948 when the cribbing of second decontamination-cycle supernatant was started. Before this time, all second-cycle wastes had been stored in underground tanks. The mechanics of ground disposal were similar to that for concentration building waste; i.e., after settling in an underground storage tank, the supernatant was pumped to cribs. The remaining solids, containing nearly all of the initial fission activity but only a fraction (9%) of the original volume, were held in storage.

The concept of concentrating first decontamination-cycle waste by evaporation was proposed in June 1949 and incorporated at the 242-B evaporator in December 1951. Some 6,000,000 gal of first-cycle feed were processed in this manner, achieving a volume reduction of 80.9%.

Permission was granted in May 1953 to pump a limited volume of first-cycle supernatant to ground (trenches) on a specific retention basis. Specific retention refers to the ability of a dry column of soil to retain liquid without penetration of the liquid to the water table. Approval to dispose of evaporator bottoms in a similar manner was granted in June 1954.

B Plant bismuth phosphate waste volumes were thus reduced by a factor of 3.25 over a 12-yr operational period (Anderson 1990).

2.4 HANFORD SITE RADIATION ZONES AND WARNING SIGNS

Hanford Site radiation zones are clearly marked and are commonly protected by barricades. The most common warning signs are "Surface Radioactive Contamination" and "Underground Radioactive Contamination." Figure 2-2 delineates the general areas of surface and underground contamination and suspected areas of radionuclide migration.

Detection and monitoring capabilities have evolved since the site first became operational and the meaning of warning signs and barricades have also been modified. Before 1988, barricades were required around areas where measurements exceeded 200 counts per minute (c/m). Since 1988, any area with radiation levels above detection level with portable instruments (about 50 c/m beta/gamma) have been protected with barricades. Background levels are approximately 40 c/m at the Hanford Site (Huckfeldt, Personal Communication). It should also be noted that before the early 1970's, the limit of detection was about 100 c/m and only gamma radiation was routinely measured (Mikulecky, Personal Communication).

Byproduct cake solution and waste solution from the first decontamination waste cycle (1C) contained about 10% of the original fission activity and 1% of the plutonium. The composition was estimated to be approximately:

$CePO_4$	<.01 M
$Zn_3(PO_4)_2$	<.01 M
$NaNO_3$	0.85 M
$Fe_2(SO_4)_3$	0.07 M
$NaPO_4$	0.75 M
$Cs(NO_3)_3$	<.01 M
$NH_4(SO_4)$	0.04 M
$NH_4(SiFe)$	0.07 M
NH_4NO_3	0.06 M
Pu	1%

Second decontamination-cycle waste (2C) contained less than 0.1% of the fission product activity and about 1% of the plutonium. Canyon cell drainage, previously disposed to a dry well via the 361 Settling Tank, was combined with the 2C subsequent to May 1951. The composition was estimated to be approximately:

$BiPO_4$	0.08 M
LaF	<.01 M
KOH	0.45 M
KNO_3	0.01 M
$NaNO_3$	0.34 M
$Cr(NO_3)_3$	<.01 M
NaF	0.03 M
$Mn(NO_3)_2$	0.02 M
NH_4NO_3	0.01 M
Pu	1%

"In the 224-B Concentration Building fission activity (<0.001% of that in the starting metal) of the waste was low enough to permit ground disposal. The flow was directed through a settling tank, where the bulk of the fission and product activity settled out with precipitated phosphates and lanthanum fluoride, and then to a reverse or dry well. When it was discovered that the wells were filling up with sand, presumably flowing into the well casing through the lower perforations, the wells were replaced with buried sumps [cribs]. The underground storage tanks for canyon building wastes were arranged in cascade groups of three so that suspended solids (containing the bulk of the radioactive fission products) could collect in the first tank of each series."

"The first production run was started in B Plant on April 13, 1945. The waste volumes in gallons per ton of uranium (gal/TU) were extremely high. For example, during 1944-45 at T Plant when the feed material averaged 0.38 MWD/T (megawatt days per ton, relative value), a run was limited by batch size and stored waste produced amounted to 10,602 gal/TU." B Plant rates were similar.

2.2 LIQUID WASTE HANDLING

B Plant wastes were both chemically and radiologically contaminated but their disposition was accomplished in accordance with their radiological content. High-level wastes were, and are, stored in underground tanks while intermediate level wastes were, until 1973, routed to underground cribs for disposal. Low-level wastes such as cooling water were routed to ponds and open ditches for disposal (Smith 1980). Lessons learned at T Plant ponds precluded the release of intermediate level wastes into open ponds at B Plant. These were instead discharged to reverse wells while low-level wastes were routed to B Pond. Reverse wells proved unsatisfactory because of plugging and the impact on groundwater and began to be replaced by cribs in 1946. Organic solvent bearing wastes were classified as intermediate level wastes and were disposed to cribs after September 1946.

Two types of cribs were utilized to support B Plant operations. The first was an underground chamber that received liquid wastes into a box-like, open-bottomed structure made of wooden timbers. The second was a drain field, or tile field, which introduced liquid wastes to soil through many yards of perforated underground pipe.

Both types typically rested in a gravel bed to aid in rapid dispersion of liquid to soil. Heavy metals such as uranium and plutonium contained in liquid wastes tend to be filtered by the first few feet of soil and thus are effectively contained in the soils immediately beneath the cribs. Other isotopes are less effectively filtered and are drawn downward in the soil column. Hanford drawing H-2-821 for crib 216-T-19 shows a typical example of a B Plant crib.

Other low-level liquid wastes were disposed to soil through french drains. These are underground gravel-filled encasements, usually concrete or tile pipe, with open bottoms, usually used for disposal of small volumes of low-level waste.

Trenches are commonly used for the disposal of high-salt waste or waste containing complexed radionuclides. Some are designated "specific retention" trenches, meaning that they were designed to be used until they had accumulated a specific number of curies of radioactivity (Nelson 1980; Fecht et al. 1977).

There were several methods commonly used for transporting liquid waste across the Hanford Site, including ditches, underground and aboveground pipelines, and tanker trucks. Aboveground pipelines have been removed from all sites in this report. Underground lines and encasements continue in use. Figure 2-1 depicts a schematic diagram of the major waste distribution and disposal systems in the 200 East Area.

Process lines and encasements are not included in this aggregate area but are described here since they pass through the area and have been essential to the operation of plutonium-uranium extraction (PUREX) Plant and related facilities and tank farms.

Process lines, sometimes referred to on drawings as transfer lines or process sewer lines, connect the major Hanford process facilities with each other and with their waste handling facilities. Most are 3-in.-diameter stainless-steel pipes with welded joints. Those that transport high-level waste are enclosed in steel reinforced concrete encasements. All encasements in this aggregate area are below grade, some as deep as 15 ft. Hanford drawing H-2-44500 shows the location of 200 East Area process lines. Multiple sheet drawings (Hanford drawings H-2-44501) provide greater detail and clearly identify encasements.

Encasements are concrete fixtures designed to protect from one to seven buried process lines. They vary in width, depending on the number of lines contained. The base portion is made of steel reinforced concrete that was formed and poured in place. Separate channels are sometimes provided for each process line, and the lines are raised from the encasement bottom by steel spacers. Steel plate of various design was sealed in place over the process line channels to form a water-tight seal. A steel reinforced concrete upper portion, or encasement lid, was then sealed in place to form a second water-tight seal and further protect the process lines. Riser pipes were provided to allow sampling of the interior of the encasement for contamination that might result from process line leakage. Diversion stations located at the process facilities and tank farms permit routing of process fluids to the different lines.

2.3 CHARACTERIZATION OF B PLANT LIQUID WASTE

A History of the 200 Area Tank Farms (Anderson 1990) provides characterization of the liquid wastes generated by the B Plant processes, and is summarized below.

> Alkaline coating removal waste, containing small amounts of fission products, was combined with first-cycle decontamination waste for storage. Stack drainage, initially combined with second decontamination-cycle waste was later combined with first decontamination-cycle waste in May 1951. The composition was estimated to be approximately:

$NaAlO_2$	1.2 M
NaOH	1.0 M
$NaNO_3$	0.6 M
$NaNO_2$	0.9 M
Na_2SiO_3	0.02 M
SpG	1.19
% Pu	0.4
% U	0.4

> Metal waste (MW) from the extraction contained all of the uranium, approximately 90% of the original fission products activity, and approximately 1% of the product. This waste was brought just to the neutral point with 50% caustic and then treated with an excess of sodium carbonate. The procedure yielded almost completely soluble waste at a minimum total volume. The exact composition of the carbonate complex was not known but was assumed to be a uranium phosphate-carbonate mixture. The composition was estimated to be approximately:

U	0.5 lb/gal
OH	0.71 M
CO_3	2.4 M
NO_3	2.7 M
PO_4	1.4 M
SpG	1.86
Na	4.8 M
Pu	1%

2.0 BACKGROUND

2.1 PLANT DESCRIPTION

B Plant is the central feature and key operational facility of the aggregate area and is therefore described here even though it is not subject to remediation as part of this aggregate area. Figure 2-1 depicts the general area of facilities discussed in this report.

B Plant refers to the 221-B building, a chemical separation facility constructed in 1944 to chemically extract plutonium contained in irradiated uranium fuel rods, and to related buildings in the immediate area.

Uranium bearing fuel rods were irradiated in one of the several Hanford reactors; a process that creates plutonium from uranium. The irradiated rods were transferred to B Plant where a bismuth phosphate chemical separation process was used to extract the plutonium.

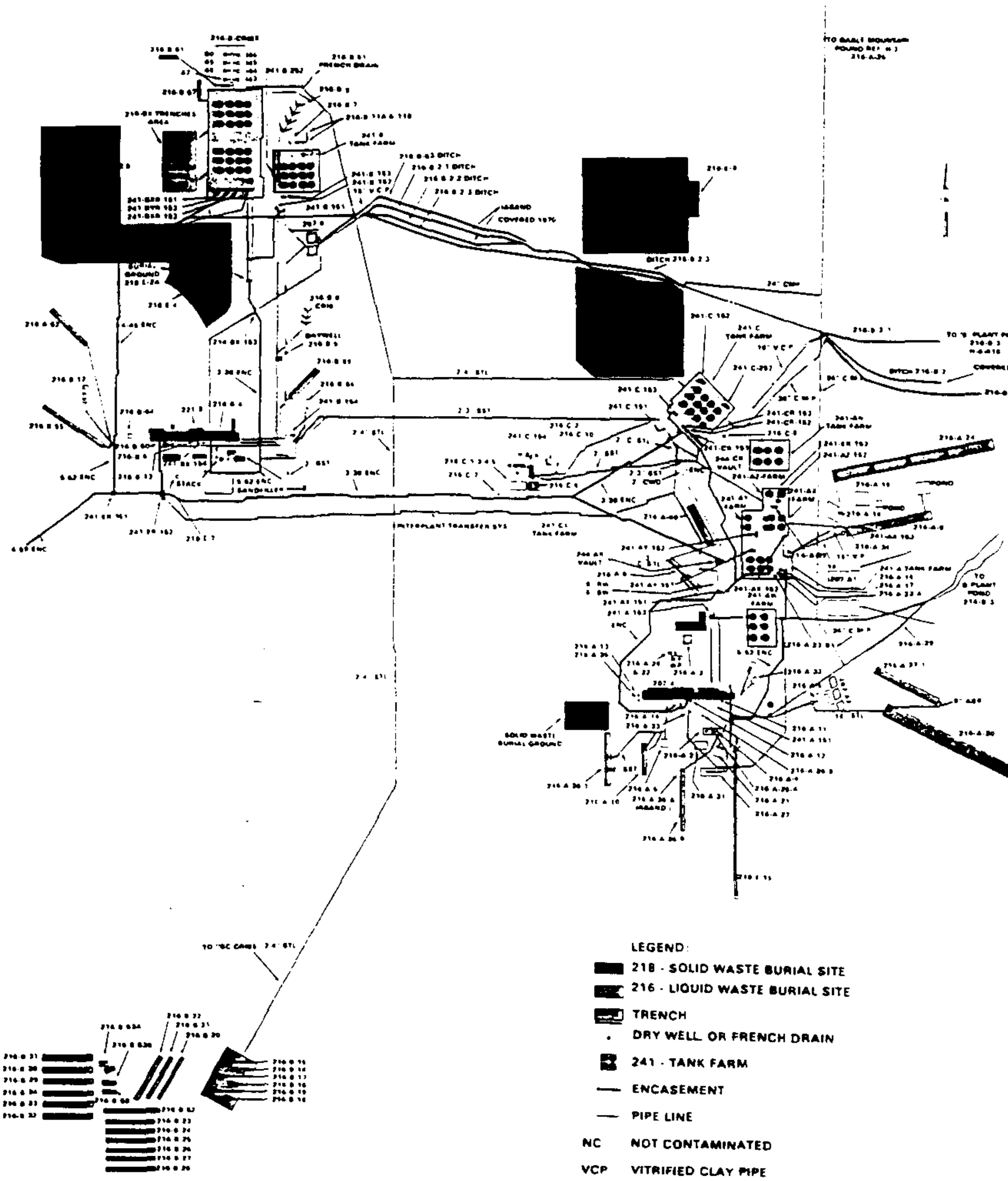
B Plant is one of five Hanford Canyon Buildings; so called because of their monolithic size and the canyon-like appearance of their upper galleries. The 221-B building is 875 ft by 85 ft by 102 ft high and is constructed entirely of concrete. Its process equipment is contained in small rooms, called cells that are arranged in rows in an area spanned by a traveling crane. The cells are topped with 4-ft-thick concrete blocks that are removable by crane to provide access to the cell beneath. Above the blocks is a space equal in height to the cell depth, thus providing headroom for manipulating the process equipment during maintenance operations. Heavy concrete shielding walls enclose this space up to the level of the crane rails, giving the appearance of a canyon (AEC-GE 1964).

B Plant chemical separation processes were based on dissolving the jacketed fuel rods in nitric acid and conducting multiple purification operations on the resultant aqueous nitrate solution. The fuel elements were charged into dissolver vats in 3-ton batches. The aluminum jackets were dissolved with a sodium hydroxide solution to which sodium nitrate was added to avoid formation of too much hydrogen. The resulting sodium aluminate-sodium nitrate solution was jetted (transferred via a steam jet) to waste. The remaining uranium metal slugs were rinsed with water and dissolved in 50 to 60% nitric acid. The bismuth phosphate process was then used to extract plutonium from the dissolved fuel rods.

No attempt to recover uranium was made in this process. Sodium nitrate solution was added to the dissolved solution to ensure that the plutonium present had a valence if +4, then bismuth nitrate and phosphoric acid were added. The resulting precipitate was separated from the solution in a solid-bowl centrifuge, and the solution was jetted to waste. The precipitate was washed in the centrifuge and dissolved in strong nitric acid. The valence of the plutonium was then adjusted to +6 by adding a dichromate solution, and a precipitate of bismuth phosphate was again formed. This time the precipitate held some of the fission products that were not extracted in the first liquid waste stream, but the plutonium remained in solution. These precipitation cycles were repeated twice.

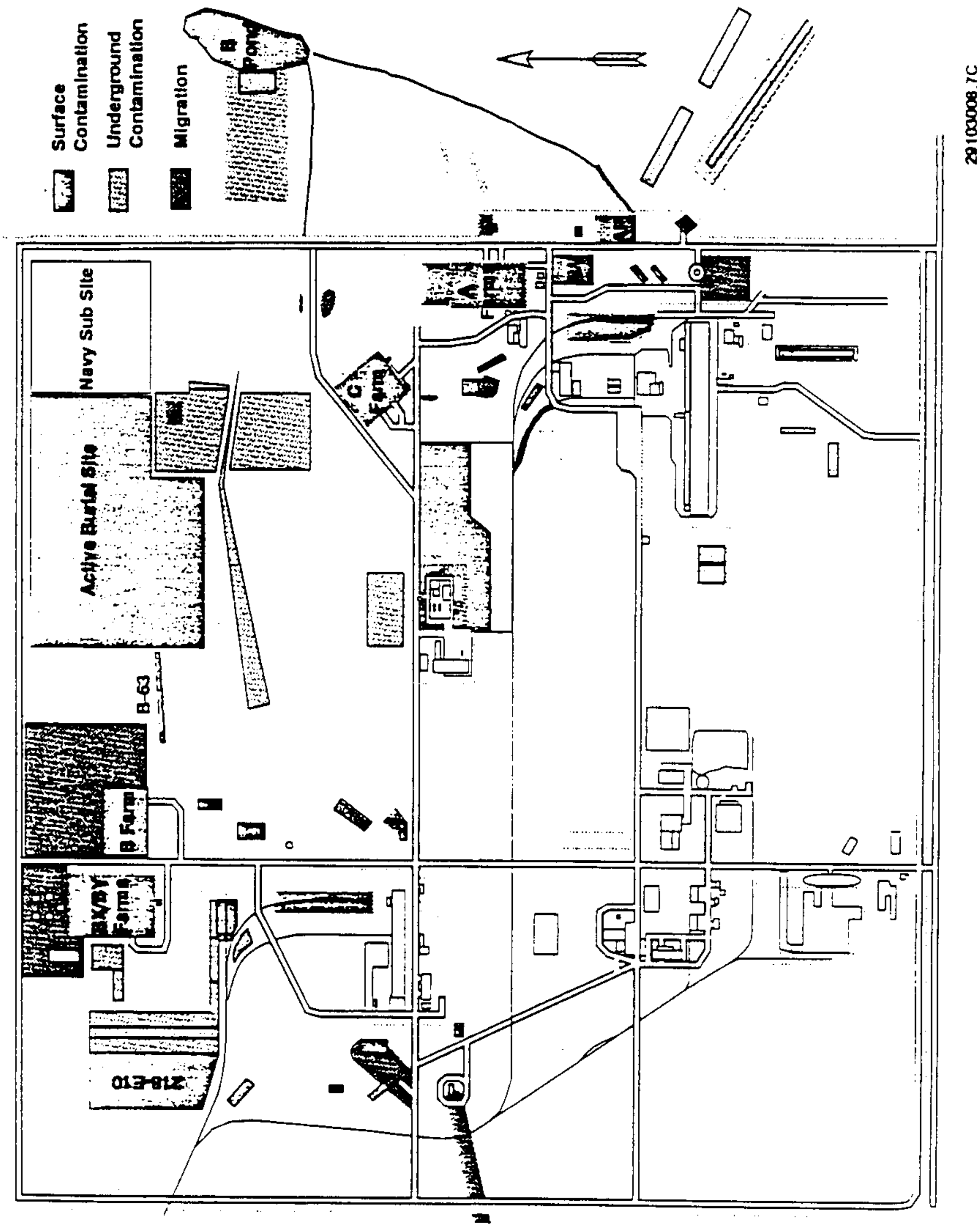
The product from this process was a dilute plutonium solution that was transferred to the 224-B concentration building where it was purified and its volume reduced. It was then transferred to the isolation building for final treatment before being shipped offsite (Ballinger and Hall 1989).

Figure 2-1. 200 East Area Waste Management Facilities.



NOTES:
1) ALL FACILITIES ARE RADIOACTIVE UNLESS MARKED OTHERWISE.

Figure 2-2. Surface and Underground Contamination of the 200 East Area.



3.0 OPERABLE UNIT 200-BP-1

Operable Unit 200-BP-1 is located in the northwest portion of the 200 East Area, along the perimeter fence, between Operable Units 200-BP-10 and 200-BP-4 (Figures 1-1 and 3-1). Fourteen sites constitute this operable unit. There are 10 inactive cribs and four unplanned releases (UPR) (Table 3-1). Except for cribs 216-B-50 and 216-B-57, all cribs were active between 1954 and 1955. Figure 3-2 provides a graphical summary of the operational history of the individual sites. The starting and stopping dates are based on data contained in BHI (1994) and listed in Table 3-2.

All the sites contain mixed waste, except crib 216-B-61, which was never constructed (Table 3-1). Eight of the 10 cribs scored over 50 on the Pacific Northwest Laboratory's (PNL) Hazard Ranking System (Stenner et al. 1988). Note, the volume of waste disposed in a crib is not necessarily directly proportional to the PNL hazard rank (Table 3-2). Since the 216-B-61 crib was not constructed is was evaluated or included in the hazard migration report (Stenner et al. 1988).

Table 3-3 provides a summary of current site conditions based on several site visits performed by the authors during September and October 1991. A list of the organic and inorganic contaminants that were part of the waste disposed in the area is given in Table 3-4. This data was extracted from BHI (1994) and has not been validated by the authors. It should be used as a guideline only.

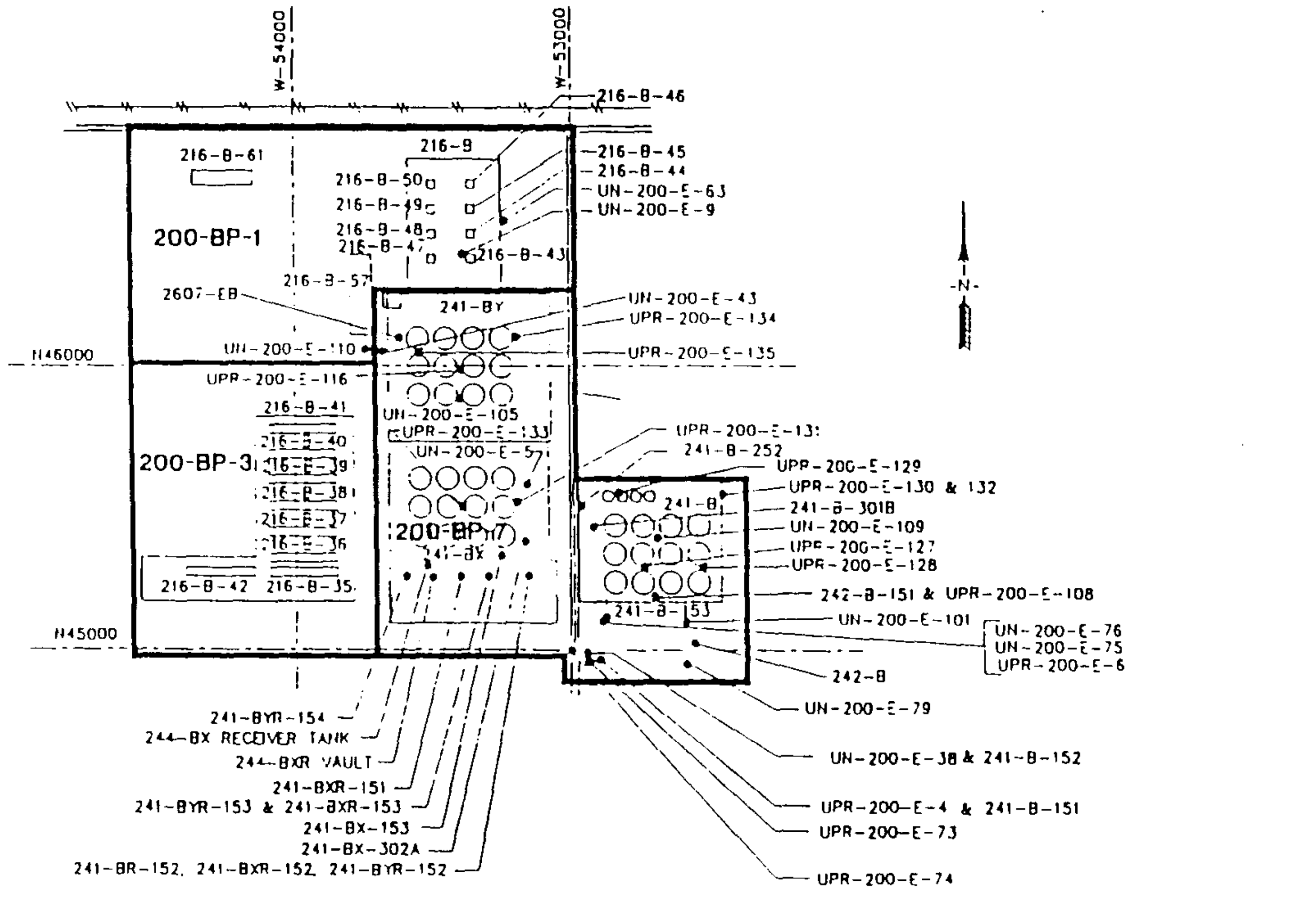
3.1 216-B-43 THROUGH 216-B-50 CRIBS

The 216-B-43 through 216-B-50 cribs are inactive waste sites located adjacent to the northern boundary of the 241-BY tank farm (Hanford photograph A-1, Appendix A). The operational history, design, and location of the cribs are similar and will therefore be discussed together. Each crib received between 2,120,000 to 6,700,000 L of scavenged tributyl phosphate (TBP) supernatant waste from the 221-B and 221-U buildings. Some inorganic liquids disposed at this site contained ferro-cyanide, nitrate, phosphate, sodium, and sulfate-based compounds. Radionuclides contained within the waste stream sent to these cribs include: cesium-137, strontium-90, ruthenium-106, plutonium, and uranium (Maxfield 1979; Cramer 1987; Brown et al. 1990; BHI 1994).

Each crib was individually deactivated by disconnecting the pipeline to the unit when the calculated specific retention of the underlying soil column was achieved. The 216-B-50 crib did not receive waste until January 1965 resulting from the crib site being taken out of operation when a cobalt-60 and cesium-137 breakthrough occurred. The decision to use the 216-B-50 crib for In-Tank Solidification (ITS) system condensate was made following 8 to 9 yr of observations when it was shown that the groundwater activity levels were definitely decreasing (Curren 1972).

Vadose wells 299-E33-1, 299-E33-2, 299-E33-3, 299-E33-5, 299-E33-6, 299-E33-7, 299-E33-13, 299-E33-22, and 299-E33-23 monitor the soil column beneath the crib site. Scintillation probe profiles indicate the radioactive contaminant plume extends to groundwater beneath almost all cribs. Crib 216-B-47 appears to be an exception where the radioactive contaminants may still be suspended in the soil column (BHI 1994).

Figure 3-1. Location Map for Operable Units 200-BP-1, 200-BP-3, and 200-BP-7.



DRAWN	CHKD.	APPD.	DATE	REV.	DESCRIPTION
JJA			1/89	1.0	
JJA			3/89	2.0	UPDATE CURRENT O.U.
JJA			1/91	3.0	INFORMATION UPDATE

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

200 East Area
Operable Units
200-BP-1, 200-BP-3 and 200-BP-7

OU\2BP-137

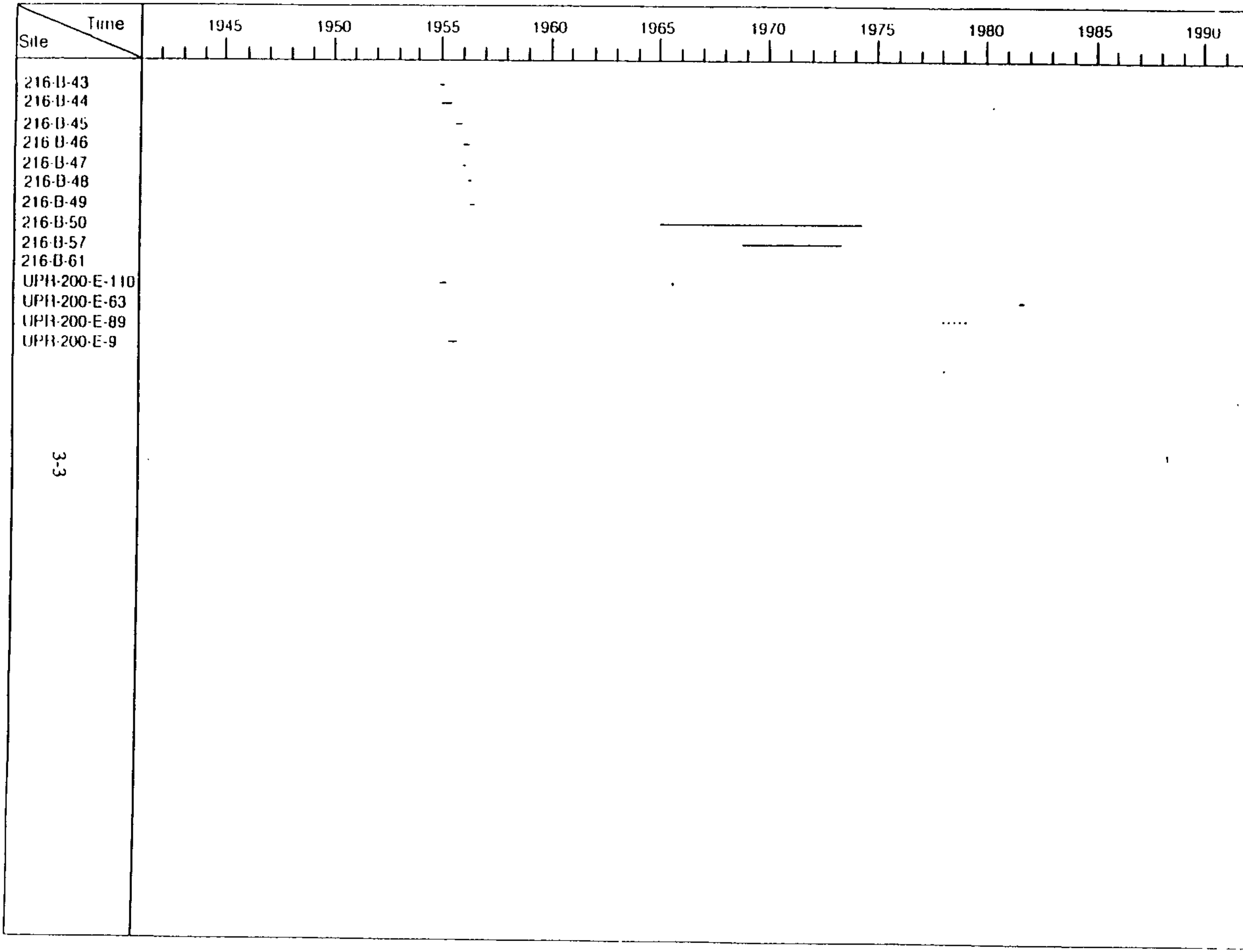


Figure 3-2. Summary of Operational Periods for Operable Unit 200-BP-1.

Table 3-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-1.

Site	Type of Site	Status	Coordinates	Type of Waste
216-B-43	Crib	Inactive	N46375 W53359	Mixed Waste
216-B-44	Crib	Inactive	N46460 W53359	Mixed Waste
216-B-45	Crib	Inactive	N46545 W53359	Mixed Waste
216-B-46	Crib	Inactive	N46630 W53359	Mixed Waste
216-B-47	Crib	Inactive	N46375 W53499	Mixed Waste
216-B-48	Crib	Inactive	N46460 W53499	Mixed Waste
216-B-49	Crib	Inactive	N46545 W53499	Mixed Waste
216-B-50	Crib	Inactive	N46630 W53499	Mixed Waste
216-B-57	Crib	Inactive	N46160 W53775, N46360 W53775 (centerline)	Mixed Waste
216-B-61	Crib	Inactive	N46650 W54175, N46650 W54350	Nonhazardous/Nonradioactive
UN-200-E-110	Unplanned Release	Inactive	N46050 W53800	Mixed Waste
UN-200-E-63	Unplanned Release	Inactive	N46500 W53275	Mixed Waste
UN-200-E-89	Unplanned Release	Inactive	N46500 W53800	Mixed Waste
UN-200-E-9	Unplanned Release	Inactive	N46400 W43525	Mixed Waste

Table 3-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-1.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-B-43	Liquid	November 1954	November 1954		Top	75	75	15	420	2120000	57 89	
216-B-44	Liquid	November 1954	March 1955		Top	75	75	15	420	5600000	60 40	
216-B-45	Liquid	April 1955	June 1955		Top	75	75	15	420	4920000	62 92	
216-B-46	Liquid	September 1955	December 1955		Top	75	75	15	420	6700000	62 92	
216-B-47	Liquid	September 1955	September 1955		Top	75	75	15	420	3710000	1 31	
216-B-48	Liquid	November 1955	November 1955		Top	75	75	15	420	4090000	62 92	
216-B-49	Liquid	November 1955	December 1955		Top	75	75	15	420	6700000	62 92	
216-B-50	Liquid	January 1965	January 1974		Top	75	75	15	460	54800000	50 34	
216-B-57	Liquid	February 1968	June 1973		Top	200	15	[illegible]	680	84400000	50 34	
216-B-61	Liquid	Not Used	Not Used		Bot	0	0	0	0	0	0 00	
UN-200-E-110	Liquid			August 7, 1955	Top	0	0	[illegible]	0	0	1 14	
UN-200-E-63	Liquid			June 4, 1981	Top	0	0	0	0	0	0 00	
UN-200-E-89	Solid			1978	Top	0	0	0	0	0	1 36	
UN-200-E-9	Liquid			September 15, 1955	Top	0	0	0	0	0	0 00	

Table 3-3. Summary of Site Visit Parameters Observed by Authors September 1991.

Area of Surface Contamination and Radiation Zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-1.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad Zone (sq ft)
216-B-43	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-44	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-45	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-46	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-47	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-48	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-49	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-50	Light Chain	Surf +Underground Contam	None	Soil cover/Backfill	3.0	None	None	0	6800
216-B-57	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Gravel/Soil Cover	1.0	None	None	0	15197
216-B-61	Light Chain	Underground Contamination	Concrete Post w/ Plaque	None/Unknown	0.0	Non-native Grass	None	0	0
UN-200-E-110	Chain Link Fence	Surface Contamination	None	None/Unknown	0.0	None	Inside Tank Farm	0	0
UN-200-E-63	Light Chain	Surface Contamination	None	None/Unknown	-5.0	Brush/Grass	None	0	0
UN-200-E-89	Light Chain	Surf +Underground Contam	None	None/Unknown	0.0	None	None	0	0
UN-200-E-9	Light Chain	Surf +Underground Contam	None	None/Unknown	0.0	None	None	0	0

Table 3-4. Inorganic and Organic Contaminants Identified at Sites Within Operable Unit 200-BP-1.

Site	Fluoride (kg)	FeCN (kg)	HNO3 (kg)	Potassium (kg)	Sodium (kg)	SulfAcid (kg)	Oxylate (kg)	Na Oxalate (kg)	NHHNO3 (kg)	Nitrite (kg)	Nitrate (kg)	Phosphate (kg)	Sulfamic Acid (kg)
216-B-43	0	1100	0	0	170000	0	0	0	0	0	400000	21000	29000
216-B-44	0	3000	0	0	330000	0	0	0	0	0	800000	40000	60000
216-B-45	0	2600	0	0	340000	0	0	0	0	0	90000	41000	60000
216-B-46	0	4000	0	0	500000	0	0	0	0	0	1200000	70000	100000
216-B-47	0	2000	0	0	310000	0	0	0	0	0	700000	40000	60000
216-B-48	0	2200	0	0	400000	0	0	0	0	0	1000000	60000	80000
216-B-49	0	4000	0	0	600000	0	0	0	0	0	1500000	60000	80000
216-B-50	0	0	0	0	500	0	0	0	10000	0	1500	0	0
216-B-57	0	0	0	0	0	0	0	0	0	0	0	0	0

Stabilization of the crib site began in 1975 and was completed in November 1977. Stabilization activities included removal of radioactive vegetation, removal and blanking of all crib vent risers below grade, removal of a buried radioactive spill adjacent to the B-43 crib, extension of all monitoring well casings above grade, grading of crib site surface, placement of two 10-ft by 100-ft test strips treated with lithium chloride (to determine effectiveness of root barrier), and addition of 6 in. of sand over a 10-mil plastic root barrier, addition of at least 12 in. of topsoil seeded with cheatgrass and Siberian wheatgrass treated with the herbicide urea borate (Maxfield 1979).

In 1991 contaminated soil from the open area between the 216-B-43 through 216-B-50 cribs, 12th Street, and Baltimore Avenue was excavated and placed on top of the 216-B-43 through 216-B-50 cribs and the 216-B-57 trench. The crib and trench areas were then capped with clean soil and re-posted with underground radioactive material warning signs (prior to remedial activities, crib and trench areas were posted with surface contamination signs). Recent drilling activities at the crib and trench sites required that the sites be re-posted with surface contamination warning signs (Environmental Protection, personal communication, 1991; site visit by authors, November 1991).

At the present time, the area has no vegetation and is about 3-ft above grade. Monitoring well casings were extended 12 to 18 in. above the new pad. Location of the flush tank could not be determined because of site stabilization, however, Hanford drawings H-2-2603 and H-2-2605 show the location of the flush tank between the crib site and the northern boundary of the 241-BY tank farm (site visit by authors, September 1991).

3.2 216-B-50 CRIB

From January 1965 until January 1973 the 216-B-50 crib received 54,800,000 L of waste storage tank condensate from the ITS system #1 unit in the 241-BY tank farm. Discharge to the crib was about 5 to 6 gal/min of condensate. Around 1968 the capacity of ITS #1 was doubled (Project ICE-618). The quantity of waste generated (about 12 gal/min) was now greater than the designed disposal rate (5 to 6 gal/min) of the 216-B-50 crib. This created concern that an increase in water level could drive the condensate through the highly contaminated zone under the other seven cribs. Chemical data obtained from monitoring wells shows condensate sent to the 216-B-50 crib tends to migrate beneath the highly contaminated cribs (Finch 1968). The 216-B-50 crib was to be taken out of operation when the calculated specific retention capacity of the underlying soil column was achieved, but may have been retired prematurely due to "size" limitations and because of its close proximity to the highly contaminated 216-B-43 through 216-B-49 cribs used for scavenged TBP waste (Finch 1968; BHI 1994).

3.3 216-B-57 TRENCH

The 216-B-57 is an inactive waste site located adjacent to the northwest corner of the 241-BY tank farm. From February 1968 to June 1973, 84,400,000 L of waste storage tank condensate from the ITS #2 unit of the 241-BY tank farm were disposed at this site. Inorganic liquid waste was also deposited to this trench and consisted primarily of aluminum carbonate. Radionuclides contained in the waste stream include: cesium-137, ruthenium-106, strontium-90, plutonium, and uranium (Cramer 1987; Brown et al. 1990; BHI 1994)

Vadose well 200-E33-24 monitors the soil column beneath the trench site. Scintillation probe profiles indicate the radioactive contaminant plume is suspended in the sediment column from 7.6 to 19.8 m below the ground surface (Maxfield 1979).

In 1991 contaminated soil from the open area between the 216-B-43 through 216-B-50 cribs, 12th Street, and Baltimore Avenue was excavated and placed on top of the 216-B-43 through 216-B-50 cribs and the 216-B-57 trench. The crib and trench areas were then capped with clean soil and re-posted with underground radioactive material warning signs (prior to remedial activities, crib and trench areas were posted with surface contamination signs). Recent drilling activities at the crib and trench sites required that the sites be re-posted with surface contamination warning signs (Hanford photograph A-2) (Environmental Protection, personal communication, 1991; site visit by authors, November 1991).

At the present time, the area is about 2-ft above grade and covered with gravel. A 6-in. steel vent pipe is located at each end. The north vent extends about 36-in. above grade and has a 6-in. by 6-in. by 6-in. square filter box. The south vent riser is capped with a "china man hat" type vent cover. No vegetation is present atop the crib area (site visit by authors, September 1991).

3.4 216-B-61 CRIB

The 216-B-61 crib was designed to receive waste storage tank condensate from the ITS #1 unit in the 241-BY tank farm and is located about 500 ft northwest of the tank farm. This crib was designed to replace the 216-B-50 crib, which could not handle the increased capacity from the ITS #1 unit when it was modified in 1968. Although this crib was built it was never used (Harmon et al. 1975). It is listed as containing nonhazardous nonradioactive material (BHI 1994) (Table 3-1) (Finch 1968).

Monitoring wells 299-E33-25 and 299-E33-26 monitor the soil column beneath the crib. Although no waste was reportedly disposed to the crib, monitoring well data indicate low-level contaminants are present. The source of these contaminants is unknown (BHI 1994).

The 216-B-61 crib is enclosed in a light-weight chain barricade with a placard indicating a crib. A concrete identification post stands at the head of the crib and two risers appear above the ground surface near the west end of the crib (Hanford photograph A-3) (site visit by authors, October 1991).

3.5 UN-200-E-9 UNPLANNED RELEASE

This UPR occurred September 15, 1955, when approximately 11,000 gal of TBP scavenged supernatant waste overflowed the 216-BY flush tank associated with the 216-B-43 through 216-B-50 cribs. Most of the contaminated soil was excavated and placed in a shallow pit south of the 216-B-43 crib and covered with 2 ft of clean topsoil. The remaining contaminated area near the flush tank was reported to be covered with 10 ft of clean soil. The location of the flush tank could not be determined because of site stabilization, however, the cribs were covered with new soil and are presently about 2.3- to 3-ft above grade (Maxfield 1979; site visit by authors, September 1991).

3.6 UN-200-E-63 UNPLANNED RELEASE

Radioactive contaminated vegetation (Russian Thistle) was discovered on June 4, 1981, at the gravel pit located outside the BC control area south of the 200 East Area. Russian Thistle became contaminated by uptake of radionuclides presumably from the BC crib and trench area and were subsequently blown to the gravel pit. As a result, the ground surface between the two areas was contaminated. The authors believe this UPR should be associated with Operable Unit 200-BP-2 because of its close proximity to the BC controlled area (BHI 1994). The contaminated vegetation was removed and a spraying program initiated to control future growth (Cramer 1987).

3.7 UN-200-E-89 UNPLANNED RELEASE

Contaminated particulate matter was transported offsite creating an unplanned airborne release from the 241-BX tank farm. The actual date or dates of the release(s) are unknown but a radiation survey in 1978 revealed minute quantities of beta/gamma emitting particulate contamination on the blacktop on the north side of Baltimore Avenue 25 ft west of the 216-B-57 crib. The contaminated section of road was covered with asphalt to reduce migration potential. The new asphalt surface contains no contaminated particulate matter, however, radionuclide activity is detected through the new cover (Maxfield 1981; Health Physics, personal communication, 1991; BHI 1994).

The UPR site was established in September 1980 and has tripled in size over the last 10 yr resulting from contaminant migration along the roadway and from wind blown weeds and sand (Maxfield 1981).

3.8 UN-200-E-110 UNPLANNED RELEASE

This UPR occurred August 7, 1955, and consisted of first-cycle mixed waste from the 241-BY-112 tank. About 25,000 ft^2 around the 112-BY pit was contaminated to a level of 22 R/h as liquid contaminant spread through the soil from the BY valve pit (Stenner et al. 1988).

4.0 OPERABLE UNIT 200-BP-2

The BC disposal facility received about 120,000,000 L of scavenged TBP waste from U Plant during the period of January 1956 to December 1957. This facility received the greatest amount of radioactivity disposed at any site during the Hanford project (920,000 gross beta curies). The scavenged waste was disposed to these cribs and trenches on a specific retention basis whereby disposal volumes were much less than the total soil volume underlying the cribs and trenches. Some inorganic liquids disposed in this area include: ferrocyanide, nitrate, phosphate, sodium, and sulfate based compounds. Radionuclides contained within the waste stream include: cesium-137, strontium-90, ruthenium-106, plutonium, and uranium (Maxfield 1979; Cramer 1987; Stenner et al. 1988; Brown et al. 1990).

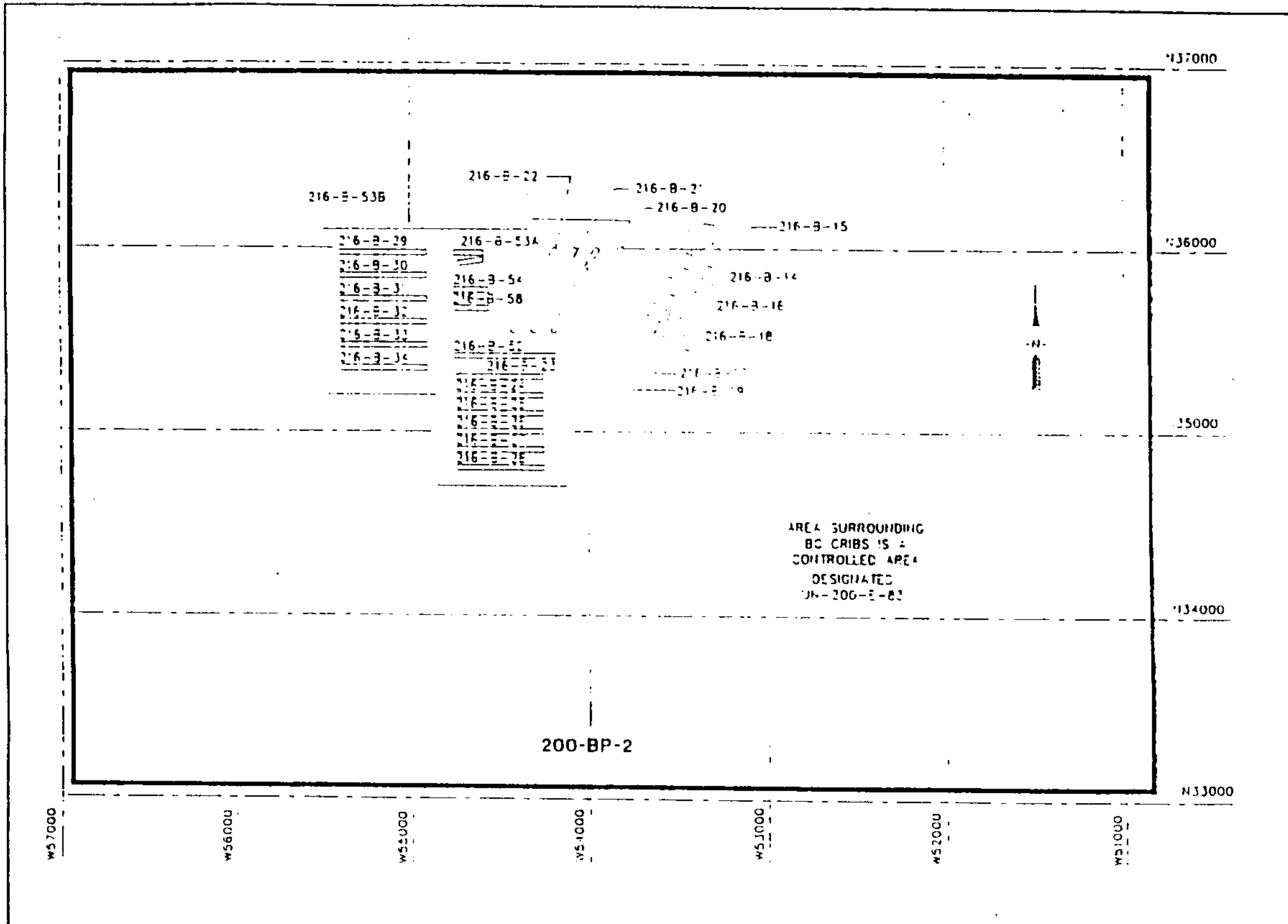
The BC crib and trench area is located south of the 200 East Area, outside the perimeter fence (Figures 1-1 and 4-1). There are six cribs, one UPR, and 20 trenches in this operable unit, for a total of 27 sites. All are inactive (Table 4-1). Figure 4-2 provides a graphical summary of the operational history of the individual sites. The starting and stopping dates are based on data contained in BHI (1994) and listed in Table 4-2.

The area can be divided into three subareas based on design, operational history, and type of waste received. The three subareas consist of the 216-B-14 through 216-B-19 cribs; 216-B-20 through 216-B-34, and 216-B-52 trenches; and the 216-B-53A, 216-B-53B, 216-B-54, and 216-B-58 trenches. The first two areas received waste from the 221-U building (200 West Area) and the third from the 300 Area laboratories (Haney 1960; BHI 1994). All of the cribs and trenches contain mixed waste, except trench 216-B-53A, which contains transuranic (TRU)-contaminated soil and mixed waste (Table 4-1). Crib 216-B-16 is the only site to score greater than 2.5 based on the PNL hazard ranking scheme, and it has a migration hazard rank of 62.92 (Stenner et al. 1988).

Table 4-3 provides a summary of current site conditions based on several site visits performed by the authors during September and October 1991. A list of the organic and inorganic contaminants that were part of the waste disposed in the area is given in Table 4-4. This data was extracted from BHI (1994) and has not been validated by the authors. It should be used as a guideline only.

4.1 216-B-14 THROUGH 216-B-19 CRIBS AND 216-B-201 SIPHON TANK

Cribs 216-B-14 through 216-B-19 are inactive waste sites located in the BC crib area west of Baltimore Avenue on 1st Street. An unmarked gravel road leads to the BC crib-trench sites, which lay outside of the 200 East security area (Hanford photograph A-4). Each crib received between 3,410,000 and 8,710,000 L of scavenged TBP supernatant waste from the 221-B building. In addition, some inorganic liquid waste was disposed at this site. These contained ferrocyanide, nitrate, phosphate, sodium, and sulfate based compounds. Radionuclides in the waste stream deposited in these cribs contained: cesium-137, ruthenium-106, strontium-90, plutonium, and uranium (Cramer 1987; Fecht et al. 1977; Brown et al. 1990; BHI 1994).



DRAWN	CHKD.	APPD.	DATE	REV.	DESCRIPTION
JJA			1/89	1.0	
JJA			1/91	2.0	INFORMATION UPDATE

Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

200 East Area
Operable Unit 200-BP-2

Figure 4-1. Location Map for Operable Unit 200-BP-2.

Table 4-1. Location and Waste Type Summary Table for Operable Unit 200-BP-2.

Site	Type of Site	Status	Coordinates	Type of Waste
216-B-14	Crib	Inactive	N35845 W53309 (center)	Mixed Waste
216-B-15	Crib	Inactive	N35935 W53447 (center)	Mixed Waste
216-B-16	Crib	Inactive	N35716 W53389 (center)	Mixed Waste
216-B-17	Crib	Inactive	N35796 W53527 (center)	Mixed Waste
216-B-18	Crib	Inactive	N35577 W53469 (center)	Mixed Waste
216-B-19	Crib	Inactive	N35657 W53607 (center)	Mixed Waste
216-B-20	Trench	Inactive	N36000 W55940, N35540 W54190 (centerline)	Mixed Waste
216-B-21	Trench	Inactive	N36000 W54055, N35540 W54305 (centerline)	Mixed Waste
216-B-22	Trench	Inactive	N36000 W54171, N35540 W54420 (centerline)	Mixed Waste
216-B-23	Trench	Inactive	N35300 W54244, N35300 W54744 (centerline)	Mixed Waste
216-B-24	Trench	Inactive	N35200 W54244, N35200 W54744 (centerline)	Mixed Waste
216-B-25	Trench	Inactive	N35100 W54244, N35100 W54744 (centerline)	Mixed Waste
216-B-26	Trench	Inactive	N35000 W54244, N35000 W54744 (centerline)	Mixed Waste
216-B-27	Trench	Inactive	N34900 W54244, N34900 W54744 (centerline)	Mixed Waste
216-B-28	Trench	Inactive	N34800 W54244, N34800 W54744 (centerline)	Mixed Waste
216-B-29	Trench	Inactive	N35972 W54900, N35972 W55400 (centerline)	Mixed Waste
216-B-30	Trench	Inactive	N35847 W54900, N35847 W55400 (centerline)	Mixed Waste
216-B-31	Trench	Inactive	N35722 W54900, N35722 W55400 (centerline)	Mixed Waste
216-B-32	Trench	Inactive	N35597 W54900, N35597 W55400 (centerline)	Mixed Waste
216-B-33	Trench	Inactive	N35472 W54900, N35472 W55400 (centerline)	Mixed Waste
216-B-34	Trench	Inactive	N35347 W54900, N35347 W55400 (centerline)	Mixed Waste
216-B-52	Trench	Inactive	N35415 W54170, N35415 W54750 (centerline)	Mixed Waste
216-B-53A	Trench	Inactive	N35973 W54583, N35973 W54750 (centerline)	TRU-Contaminated Soil Site/Mixed
216-B-53B	Trench	Inactive	N35937 W54583, N35916 W54723 (centerline)	Mixed Waste
216-B-54	Trench	Inactive	N35772 W54550, N35772 W54750 (centerline)	Mixed Waste
216-B-58	Trench	Inactive	N35672 W54550, N35672 W54750 (centerline)	Mixed Waste
UN 200-E-83	Unplanned Release	Inactive	N36000 W53000, N36000 W55800, N34400 W55800, N34400 W53000	Mixed Waste

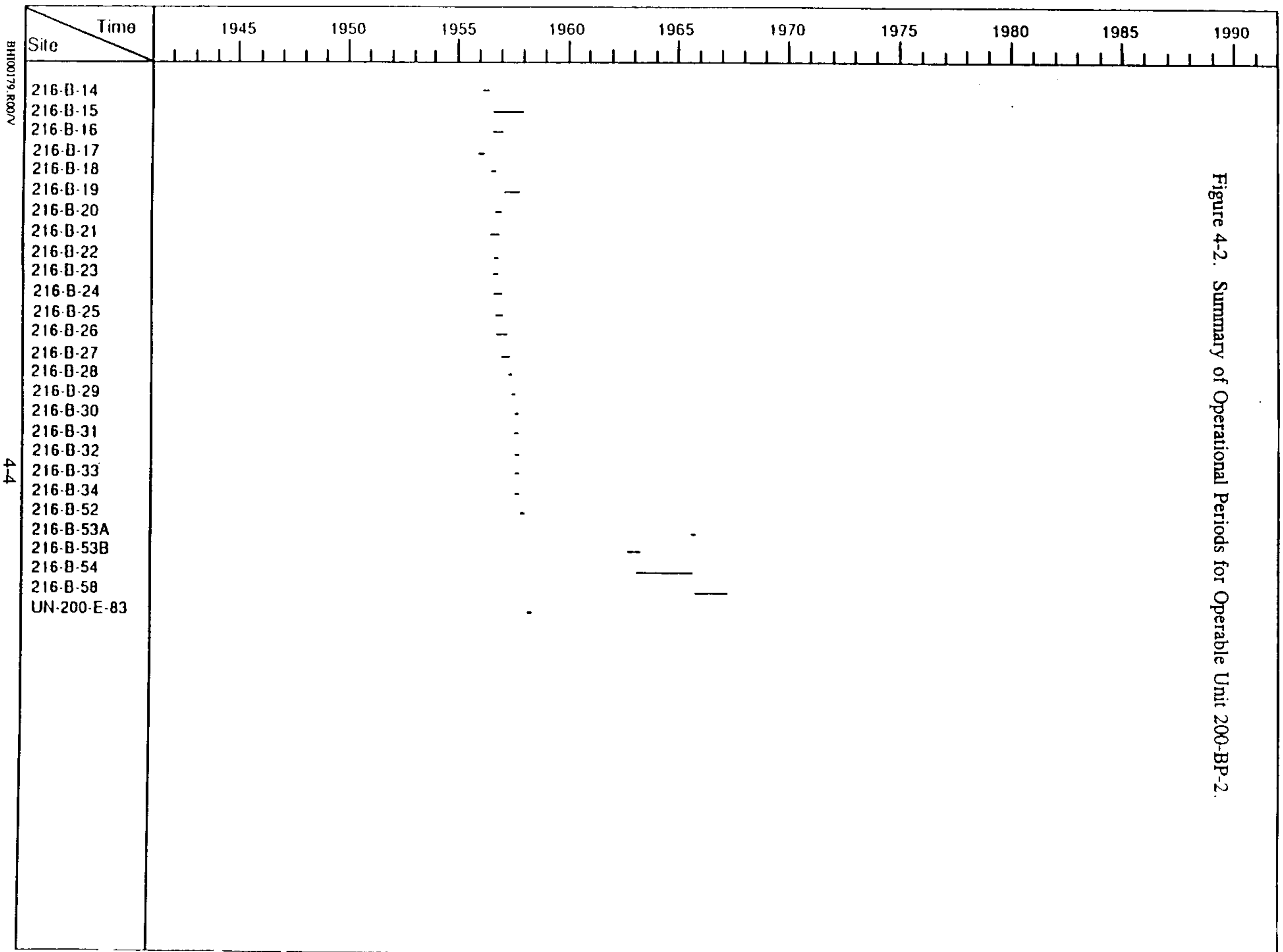


Figure 4-2. Summary of Operational Periods for Operable Unit 200-BP-2.

BHI00179.R00/V

Table 4-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-2.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo. Depth (ft)	Volume of Pu Contam. Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking
216-B-14	Liquid	January 1956	February 1956		Top	80	80	12	410	8710000	2.27
216-B-15	Liquid	April 1956	December 1957		Top	80	80	15	410	6320000	1.36
216-B-16	Liquid	April 1956	August 1956		Top	80	80	12	410	5600000	62.92
216-B-17	Liquid	January 1956	January 1956		Top	80	80	14	410	3410000	1.36
216-B-18	Liquid	March 1956	April 1956		Top	80	80	14	410	8520000	1.36
216-B-19	Liquid	February 1957	October 1957		Top	80	80	14	410	6400000	1.82
216-B-20	Liquid	August 1956	September 1956		Bot	500	10	10	270	4680000	1.36
216-B-21	Liquid	September 1956	October 1956		Bot	500	10	10	310	4670000	1.31
216-B-22	Liquid	October 1956	October 1956		Bot	500	10	12	310	4740000	1.36
216-B-23	Liquid	October 1956	October 1956		Bot	500	10	8	160	4520000	1.36
216-B-24	Liquid	October 1956	November 1956		Bot	500	10	8	230	4700000	1.31
216-B-25	Liquid	November 1956	December 1956		Bot	500	10	10	310	3760000	1.31
216-B-26	Liquid	December 1956	February 1957		Bot	500	10	8	160	5880000	1.36
216-B-27	Liquid	February 1957	April 1957		Bot	500	10	8	230	4420000	1.31
216-B-28	Liquid	April 1957	June 1957		Bot	500	10	13	310	5050000	1.36
216-B-29	Liquid	June 1957	July 1957		Bot	500	10	10	270	4840000	1.31
216-B-30	Liquid	July 1957	July 1957		Bot	500	10	11	270	4780000	1.36
216-B-31	Liquid	July 1957	August 1957		Bot	500	10	10	190	4740000	1.36
216-B-32	Liquid	August 1957	September 1957		Bot	500	10	10	270	4770000	1.36
216-B-33	Liquid	September 1957	October 1957		Bot	500	10	10	310	4740000	1.42
216-B-34	Liquid	October 1957	October 1957		Bot	500	10	10	190	4870000	1.42
216-B-52	Liquid	December 1957	January 1958		Bot	580	10	10	190	8530000	1.42
216-B-53A	Liquid	October 1965	November 1965		Bot	60	10	10	24	549000	0.98
216-B-53B	Liquid	November 1962	March 1963		Bot	150	10	8	40	15100	1.04
216-B-54	Liquid	March 1963	October 1965		Bot	200	10	8	68	999000	1.04
216-B-58	Liquid	November 1965	June 1967		Bot	200	10	8	470	413000	1.04
UN 200 E 83	Solid			May 1958	Top	0	0	0	0	0	0.73

Table 4-3. Summary of Site Visit Parameters Observed by Authors during September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-2.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con (sq ft)	Rad Zone (sq ft)
216-B-14	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Brush/Grass	None	0	19398
216-B-15	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Brush/Grass	None	0	19398
216-B-16	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Brush/Grass	None	0	19396
216-B-17	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Brush/Grass	None	0	19396
216-B-18	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Brush/Grass	None	0	19396
216-B-19	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Brush/Grass	None	0	19396
216-B-20	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-21	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-22	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-23	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-24	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-25	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-26	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-27	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-28	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-29	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-30	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-31	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-32	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-33	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-34	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-52	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/Backfill	2 0	Non-native Grass	None	0	0
216-B-53A	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/Backfill	2 0	Non-native Grass	None	0	75000
216-B-53B	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/Backfill	2 0	Non-native Grass	None	0	75000
216-B-54	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/backfill	2 0	Non-native Grass	None	0	75000
216-B-58	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Soil cover/Backfill	2 0	Non-native Grass	None	0	75000
UN-200-E-83	Light Chain	Surface Contamination	None	None/Unknown	0 0	Brush/Grass	None	0	0

Table 4-4. Inorganic and Organic Contaminants Identified at Sites Within Operable Unit 200-BP-2.

Site	Fluoride (kg)	FeCN (kg)	HNO3 (kg)	Potassium (kg)	Sodium (kg)	SulfAcid (kg)	Oxylate (kg)	Na Oxalate (kg)	NH4NO3 (kg)	Nitrite (kg)	Nitrate (kg)	Phosphate (kg)	Sulfamic Acid (kg)
216-B-14	0	5000	0	0	600000	0	0	0	0	0	1500000	40000	50000
216-B-15	0	3300	0	0	400000	0	0	0	0	0	900000	50000	60000
216-B-16	0	3000	0	0	500000	0	0	0	0	0	1100000	70000	110000
216-B-17	0	1800	0	0	500000	0	0	0	0	0	1100000	60000	90000
216-B-18	0	5000	0	0	400000	0	0	0	0	0	1000000	50000	70000
216-B-19	0	3400	0	0	700000	0	0	0	0	0	1500000	100000	90000
216-B-20	0	2500	0	0	500000	0	0	0	0	0	1100000	80000	100000
216-B-21	0	2500	0	0	310000	0	0	0	0	0	700000	40000	60000
216-B-22	0	2500	0	0	400000	0	0	0	0	0	900000	40000	80000
216-B-23	0	2400	0	0	400000	0	0	0	0	0	1000000	60000	60000
216-B-24	0	2500	0	0	280000	0	0	0	0	0	600000	34000	50000
216-B-25	0	2000	0	0	220000	0	0	0	0	0	500000	27000	40000
216-B-26	0	3100	0	0	350000	0	0	0	0	0	800000	40000	60000
216-B-27	0	2300	0	0	260000	0	0	0	0	0	600000	32000	50000
216-B-28	0	2700	0	0	400000	0	0	0	0	0	1000000	50000	80000
216-B-29	0	2600	0	0	280000	0	0	0	0	0	700000	35000	50000
216-B-30	0	2500	0	0	500000	0	0	0	0	0	1100000	70000	110000
216-B-31	0	2500	0	0	500000	0	0	0	0	0	1100000	60000	90000
216-B-32	0	2500	0	0	500000	0	0	0	0	0	1000000	60000	90000
216-B-33	0	2500	0	0	700000	0	0	0	0	0	1700000	100000	110000
216-B-34	0	2600	0	0	800000	0	0	0	0	0	1900000	80000	90000
216-B-52	0	5000	0	0	860000	0	0	1000	0	0	2100000	80000	80000
216-B-53B	0	0	0	0	0	0	0	0	0	0	1	0	0
216-B-54	0	0	0	0	0	0	0	0	0	0	100	0	0
216-B-58	0	0	0	0	0	0	0	0	0	0	10	0	0

The cribs were individually deactivated by disconnecting the pipeline to the unit when the calculated specific retention of the underlying soil column was achieved (Lundgren 1979).

Wells 299-E13-1, 299-E13-2, 299-E13-3, 299-E13-4, 299-E13-5, 299-E13-20, and 299-E13-21 completed in the vadose zone are used to monitor the soil column beneath the crib site. Scintillation probe profiles indicate the radioactive contaminant plume may extend to groundwater below the B-14 and B-16 cribs (BHI 1994).

Stabilization of the entire crib site was completed in August 1981. Before stabilization, the vent filter boxes, 8-in. vent risers, liquid level risers, 2-in. vent risers, and valve handle extensions were removed at or below existing grade and disposed in the 218-E-12B burial ground. As the vent filters and risers were removed expanding rubber plugs were installed in each opening. The eight ? vadose monitoring well casings were extended to accommodate the addition of clean soil cover. Two and one-half feet of topsoil treated with the herbicides picloram, dicamba and 2,4-D amine plus a polymer, and a rodent deterrent consisting of sucrose octa-acetate were added as cover material then seeded with Wintergraze, Thickspike, Crested, and Siberian wheatgrasses (Winterhalder 1981).

Concrete posts with brass crib identification plates denote individual crib sites. The perimeter of the crib site is marked with metal posts and a light-weight chain barricade. The metal posts display three types of signs; the first, indicates the site is a radiologically controlled area with potential surface contamination off established roadways, and to contact Health Physics before entering. The second, a placard indicating underground contamination. The third, delineates an underground pipeline and underground contamination (site visit by authors, September 1991).

About 100 ft south of the BC cribs is a 30 ft by 100 ft area delineated with metal posts and underground contamination signs. This area is devoid of any vegetation (Hanford photograph A-5). It is not reflected on any of the Hanford drawings and is reported to be a radionuclide migration study area (Personal communication Health Physics, September 1991).

Evidence of wildlife (rabbit droppings, paw and hoof prints) is seen throughout the BC crib area (site visit by authors, September 1991).

4.2 216-B-20 THROUGH 216-B-34 AND 216-B-52 TRENCHES

Uranium rich waste from the bismuth phosphate separations processes was removed from underground storage tanks and reprocessed to recover additional uranium. After the uranium was recovered, cesium and strontium were precipitated out and the remaining TBP supernatant waste was released to the ground in the BC disposal area. Trenches 216-B-20 through 216-B-34 and 216-B-52 were to receive a portion of the bismuth phosphate waste. The operational history, design, and location of the trenches are similar and thus will be discussed together. Each trench received between 3,760,000 and 8,530,000 L of scavenged TBP supernatant waste from the 221-U building. Some inorganic liquids disposed at this site contained: ferrocyanide, nitrate, phosphate, sodium, and sulfate based compounds. Radionuclides contained within the waste stream include: cesium-137, strontium-90, ruthenium-106, plutonium, and uranium (Cramer 1987; Brown et al. 1990).

The trenches were individually deactivated by disconnecting the aboveground pipeline to the unit when the calculated specific retention of the underlying soil column was achieved. The pipe was removed and disposed in a shallow, 3 to 4 ft, trench located between cribs 216-B-29 and 216-B-53A.

The trenches were then backfilled with excavated material that was stored adjacent to each trench (Hanford photograph A-6) (Lundgren 1979).

Immediately south of the 216-B-23 through 216-B-28 trenches is an approximate 30-yd by 60-yd excavation used as a source for cover material during the BC crib stabilization process (Hanford photograph A-7) (Personal Communication, Health Physics, October 1991; site visit by authors, September 1991).

Adjacent to the western boundary or the 216-B-29 through 216-B-34 cribs (Hanford photograph A-8) is the state owned U.S. Ecology burial facility (site visit by authors, September 1991).

4.3 216-B-53A, 216-B-53B, 216-B-54, and 216-B-58 TRENCHES

These four trenches received waste from the Plutonium Recycle Test Reactor in the 300 Area. Trenches 216-B-53A, 216-B-53B, and 216-B-54 are each divided in half by an earthen dam across the center of the trench. Earthen dams divide trench 216-B-58, which is divided into eight 25-ft sections. A "Sisalkraft" cover (a wooden frame consisting of 1 ft by 2 ft and 2 ft by 4 ft covered with Sisalkraft roofing paper) lay over each trench while in operation (Hanford drawing H-2-3337). Each trench received between 15,100 and 999,000 L of liquid waste from the Hanford laboratories operations and PNL. The Hazardous Chemical Inventory contained in BHI (1994) indicates between 1 to 100 kg of nitrates were contained in the waste streams generated from the 300 Area (Haney 1960; Mirabella 1977; Stenner et al. 1988).

Deactivation of the trenches consisted of disconnecting the aboveground pipeline to the unit when the calculated specific retention of the underlying soil column had been achieved. The pipes were buried in a shallow, 3 to 4 ft, trench between 216-B-29 and 216-B-53A. Approximate coordinates are N-36000, W-54800 (Maxfield 1979).

Vadose well 299-E13-61 monitors the soil column beneath the trenches. Considering a depth to groundwater at about 338 ft below ground surface, a low PNL Hazardous Ranking System migration score, and relatively small quantities of waste discharged to the facilities suggests the waste in the sediment column has not reached groundwater (Fecht et al. 1977).

After backfilling the trenches, the area was stabilized by adding 2 ft of topsoil and seeding with Thickspike, Siberian, and Crested wheatgrasses (BHI 1994).

The light-weight chain barricade does not encompass the entire area and is absent in several places and no concrete markers are present. Non-native vegetation covers about 80% of the stabilized area (site visit by authors, September 1991).

4.4 UN-200-E-83 UNPLANNED RELEASE

In 1958 radioactive contaminants spread from the BC crib and trench area, south, west, and east in what is now defined as the BC Controlled Area (Figure 4-1). Native wildlife burrowed into one of the inoperable trenches (216-B-28) ingested the radiologically contaminated salt deposits and transmitted the contaminants through the food chain. Radioactive feces and vegetation sprayed with contaminated urine were detected in about a 4 mi^2 area of undisturbed land to the southeast and west of the BC cribs and trenches. Radiological surveillance information estimates that the contaminated area could be as great as 15 mi^2 (BHI 1994). An environmental assessment report obtained from Health Physics, divided this area into two zones. Zone A, comprises approximately 560 acres with over 2,000 radioactive fecal droppings per acre. Zone B, which is less contaminated than zone A, consists of approximately 2,000 acres with about 100 radioactive droppings/acre. It is estimated that approximately 81 Ci of strontium-90 and 14 Ci of cesium-137 are distributed over the 4 mi^2 area (Maxfield 1979; BHI 1994).

A burrow discovered at the 216-B-28 trench was filled with gravel and capped with asphalt. In addition, circa 1969 action was taken to inhibit radioactive weed growth on the trenches. This included bringing all trenches to ground level 10 ft above the bottom of each trench by the addition of sand fill topped with gravel (Hanford photograph A-9). All trenches except 216-B-20, 216-B-21, and 216-B-22 were topped with 6 in. of gravel only. A total of 60,000 yd^3 of sand and gravel were used to complete the project (Mirabella 1977; BHI 1994). The stabilized areas are 2 to 3 ft above the access road and have nonnative vegetation over 80% of the stabilized areas (site visit by authors, 1991).

5.0 OPERABLE UNIT 200-BP-3

Surrounded by Operable Units 200-BP-1, 200-BP-7, and 200-BP-10 this operable unit is located in the northwest portion of the 200 East Area (Figures 1-1 and 3-1). It consists of eight inactive mixed-waste disposal trenches that operated in the mid-1950's (Tables 5-1 and 5-2). Each of the specific retention trenches received less than 2,000,000 L of waste, except for trench 216-B-38, which received 4,320,000 L of waste. None of the trenches scored higher than 1.5 on the PNL Hazard Ranking System.

Figure 5-1 provides a graphical summary of the operational history of the individual sites. The starting and stopping dates are given in Table 5-2. Table 5-3 summarizes current surface conditions at the site based on site visits by the authors during September and October 1991. A list of the organic and inorganic contaminants believed to be deposited in the trenches is given in Table 5-4.

5.1 216-B-35 THROUGH 216-B-42 TRENCHES

The 216-B-35 through 216-B-42 trenches are an inactive waste site located about 200 ft due west of the 241-BX tank farm (Hanford photograph A-10). The operational history, design, and location of the trenches are similar and will therefore be treated as a single site. The trenches received between 1,060,000 and 4,320,000 L of first-cycle supernatant waste from the 221-B building between December 1953 and February 1955 (BHI 1994). Trench 216-B-37 received first-cycle bottom supernatant from the 242-B waste evaporator in August 1954. Some inorganic liquids disposed at this site contained fluoride, nitrate, nitrite, phosphate, sodium acuminate, sodium hydroxide, sodium silicate, and sulfate based compounds. Radionuclides contained within the waste stream include: cesium-137, strontium-90, ruthenium-106, plutonium, and uranium (Stenner et al. 1988; Brown et al. 1990).

Each trench was deactivated by disconnecting the aboveground pipeline to the unit when the calculated specific retention of the underlying soil column was attained. They were then backfilled to grade (Hanford photograph A-11). The authors were unable to determine where the aboveground pipe was disposed (Lundgren 1979). Stabilization of the trench site was completed on October 19, 1982, and consisted of the addition of 2 ft of topsoil treated with 2,4-d amine and Dicamba (a herbicide) and seeded with Thickspike, Crested, and Siberian wheatgrasses (BHI 1994).

Hanford drawings H-2-37986 and H-2-44501, Sheet 141, show four additional trenches labeled 216-B-41A, 216-B-41B, 216-B-41C, and 216-B-41D. However, Hanford drawing H-2-2431 and Hanford aerial photograph (A-12), taken in October 1965, shows only eight trenches oriented as shown on Hanford drawing H-2-2431. No reference to the additional trenches was found in any other documents reviewed for this report (Maxfield 1979). The authors believe these trenches were planned but not constructed. Inspection by the authors supports this conclusion (site visit by authors, September 1991).

Vadose wells 299-E8-10, 299-E8-21, 299-E8-286, 299-E8-287, 299-E8-288, 299-E8-289, and 299-E8-290 monitor the soil column beneath the trenches. Scintillation probe profiles indicate the radioactive contaminant plume is suspended in the soil above groundwater (Fecht et al. 1977).

Table 5-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-3.

Site	Type of Site	Status	Coordinates	Type of Waste
216-B-35	Trench	Inactive	N45273 W53850, N45273 W54102 (centerline)	Mixed Waste
216-B-36	Trench	Inactive	N45323 W53850, N45323 W54102 (centerline)	Mixed Waste
216-B-37	Trench	Inactive	N45413 W53850, N45413 W54102 (centerline)	Mixed Waste
216-B-38	Trench	Inactive	N45503 W53850, N45503 W54102 (centerline)	Mixed Waste
216-B-39	Trench	Inactive	N45593 W53840, N45595 W54102 (centerline)	Mixed Waste
216-B-40	Trench	Inactive	N45683 W53850, N45683 W54102 (centerline)	Mixed Waste
216-B-41	Trench	Inactive	N45573 W53850, N45773 W54102 (centerline)	Mixed Waste
216-B-42	Trench	Inactive	N45273 W54152, N45273 W54404 (centerline)	Mixed Waste

Table 5-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-3.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo. Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-B-35	Liquid	February 1954	March 1954		Bot	252	10	10	120	1060000	1.31	
216-B-36	Liquid	March 1954	April 1954		Bot	252	10	10	120	1940000	1.25	
216-B-37	Liquid	August 1954	August 1954		Bot	252	10	10	120	4320000	1.42	
216-B-38	Liquid	July 1954	1954		Bot	252	10	10	120	1430000	1.25	
216-B-39	Liquid	December 1953	November 1954		Bot	252	10	10	120	1540000	1.25	
216-B-40	Liquid	April 1954	July 1954		Bot	252	10	10	120	1640000	1.25	
216-B-41	Liquid	November 1954	November 1954		Bot	252	10	10	120	1440000	1.25	
216-B-42	Liquid	January 1955	February 1955		Bot	252	10	10	120	1500000	1.25	

Figure 5-1. Summary of Operational Periods for Operable Unit 200-BP-3.

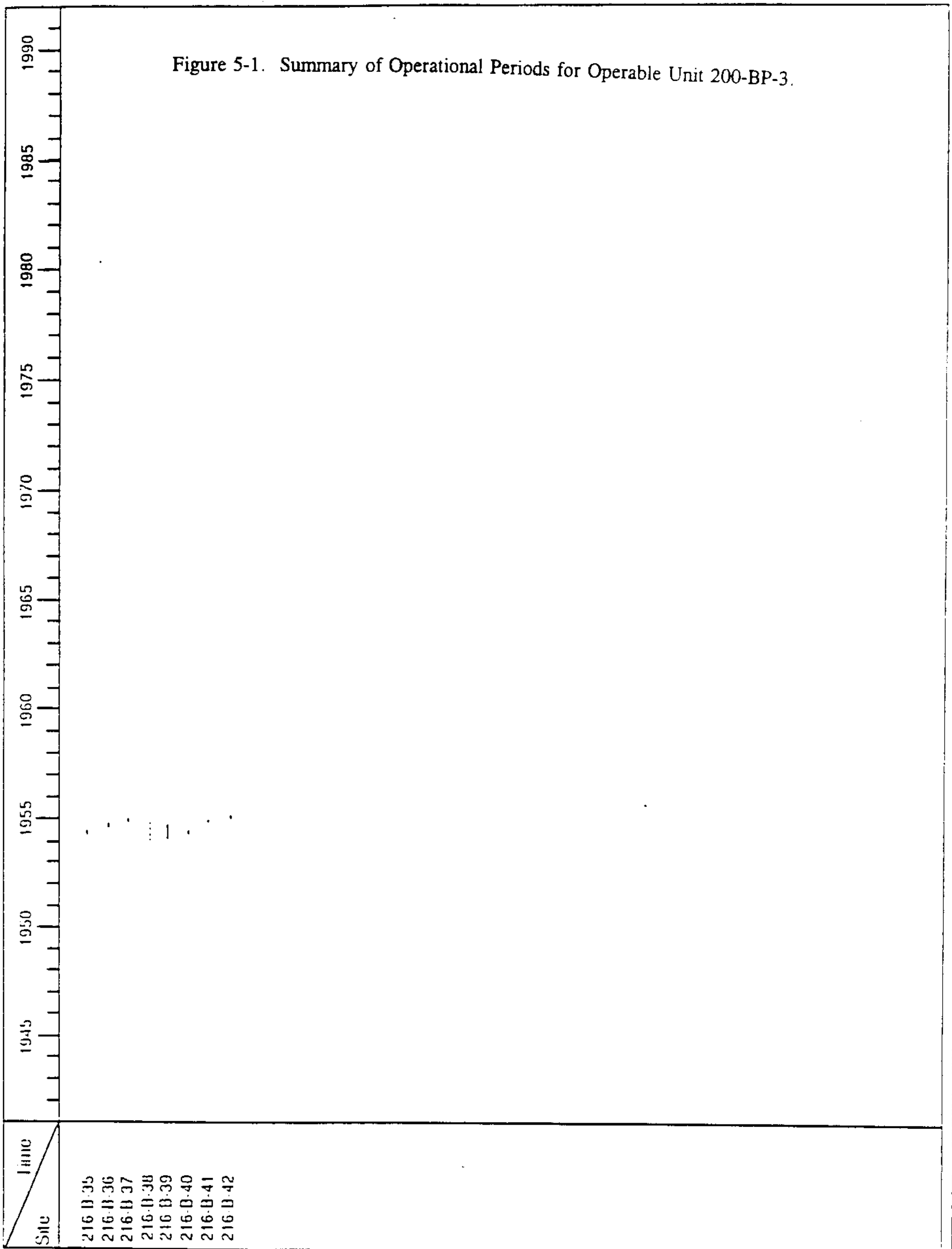


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Table 5-3. Summary of Site Visit Parameters Observed by Authors During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-3.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad Zone (sq ft)
216-B-35	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26955
216-B-36	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26955
216-B-37	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26955
216-B-38	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26955
216-B-39	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26995
216-B-40	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26955
216-B-41	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26955
216-B-42	None	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Brush/Grass	None	0	26955

Table 5-4. Inorganic and Organic Contaminants Identified at Sites Within Operable Unit 200-BP-3.

Site	Fluoride (kg)	FeCN (kg)	NaOH (kg)	Potassium (kg)	Sodium (kg)	SulfAcid (kg)	Oxylate (kg)	NaSilicate (kg)	NaAluminate (kg)	NH4NO3 (kg)	Nitrite (kg)	Nitrate (kg)	Phosphate (kg)	Sulfamic Acid (kg)
216-B-35	2600	0	20000	0	60000	0	0	5500	10000	0	10000	90000	20000	4000
216-B-36	5000	0	3800	0	120000	0	0	10000	24000	0	18000	160000	40000	8000
216-B-37	50000	0	38000	0	1300000	0	0	100000	250000	0	200000	1700000	400000	90000
216-B-38	4000	0	2800	0	90000	0	0	8000	18000	0	13000	120000	27000	6000
216-B-39	4000	0	2800	0	90000	0	0	8000	16000	0	14000	120000	29000	6000
216-B-40	4000	0	3300	0	100000	0	0	8000	20000	0	15000	130000	31000	7000
216-B-41	4000	0	2800	0	90000	0	0	8000	16000	0	13000	120000	27000	6000
216-B-42	0	800	0	0	90000	0	0	0	0	0	0	210000	11000	15000

6.0 OPERABLE UNIT 200-BP-4

Operable units 200-BP-1, 200-BP-7, 200-BP-8, and 200-PO-6 surround this operable unit, located along the northern boundary of the 200 East Area (Figures 3-1 and 6-1). Two cribs, a reverse well, and a french drain, all inactive, constitute this operable unit (Table 6-1). The reverse wells (216-B-11A and 216-B-11B) and cribs 216-B-7A and 216-B-7 B scored 47.82 and 65.44, respectively according to the PNL Hazard Ranking System (Table 6-2).

Figure 6-2 provides a graphical summary of the operational history of the individual sites. The starting and stopping dates are based on data contained in BHI (1994) and listed in Table 6-2. Table 6-3 summarizes current site conditions (site visits by authors, 1991). A list of the organic and inorganic contaminants that were part of the waste disposed in the area is given in Table 6-4. This data was extracted from BHI (1994) and has not been validated by the authors. It should be used as a guideline only.

6.1 216-B-7A AND 216-B-7B CRIBS

The 216-B-7A and 216-B-7B cribs are an inactive waste site located about 100 ft north of 241-B tank farm. The two cribs are located approximately 20 ft apart and are in line with a 3-in. steel inlet pipe that supplied waste to both cribs simultaneously (Hanford photograph A-13) (BHI 1994).

From October 1946 to August 1948, these cribs received overflow from the 201-B settling tank. Building 224-B was the source of the waste sent to the settling tank. Between October 1947 and August 1948 the cribs also received cell drainage and other liquid wastes from tank 5-6 in the 221-B building. After August 1948, liquid waste from the 224-B building was disposed directly to the cribs until October 1961. From December 1954 to October 1961, the 224-B waste consisted of clean-out waste. Between October 1961 and May 1, 1967, material disposed in these cribs consisted of decontamination construction waste from the 221-B building.

According to a letter from G. L. Hanson and P. W. Smith to O. V. Smiset (Hanson and Smith 1967), the last 198,000 gal of waste disposed in these cribs was the result of an accidental discharge to the crib site. The letter recommends that the inlet to the crib be blanked so that no additional waste can be accidentally discharged to this site.

Some inorganic liquids were also disposed at this site. Radionuclides contained within the waste stream include: cesium-137, ruthenium-106, strontium-90, about 4,300 g of plutonium, uranium, and TRU fission products (Harmon et al. 1975; Cramer 1987; Brown et al. 1990).

Vadose wells 299-E33-18, 299-E33-58, 299-E33-59, and 299-E33-73 monitor the soil column beneath the crib site. Considering the additional liquid waste disposed at this site would suggest breakthrough to groundwater has occurred at this site. Groundwater test results (Hanson and Smith 1967) indicate that cesium-137, cobalt-60, tritium, and alpha contamination are detectable in groundwater samples taken from well 299-E33-18.

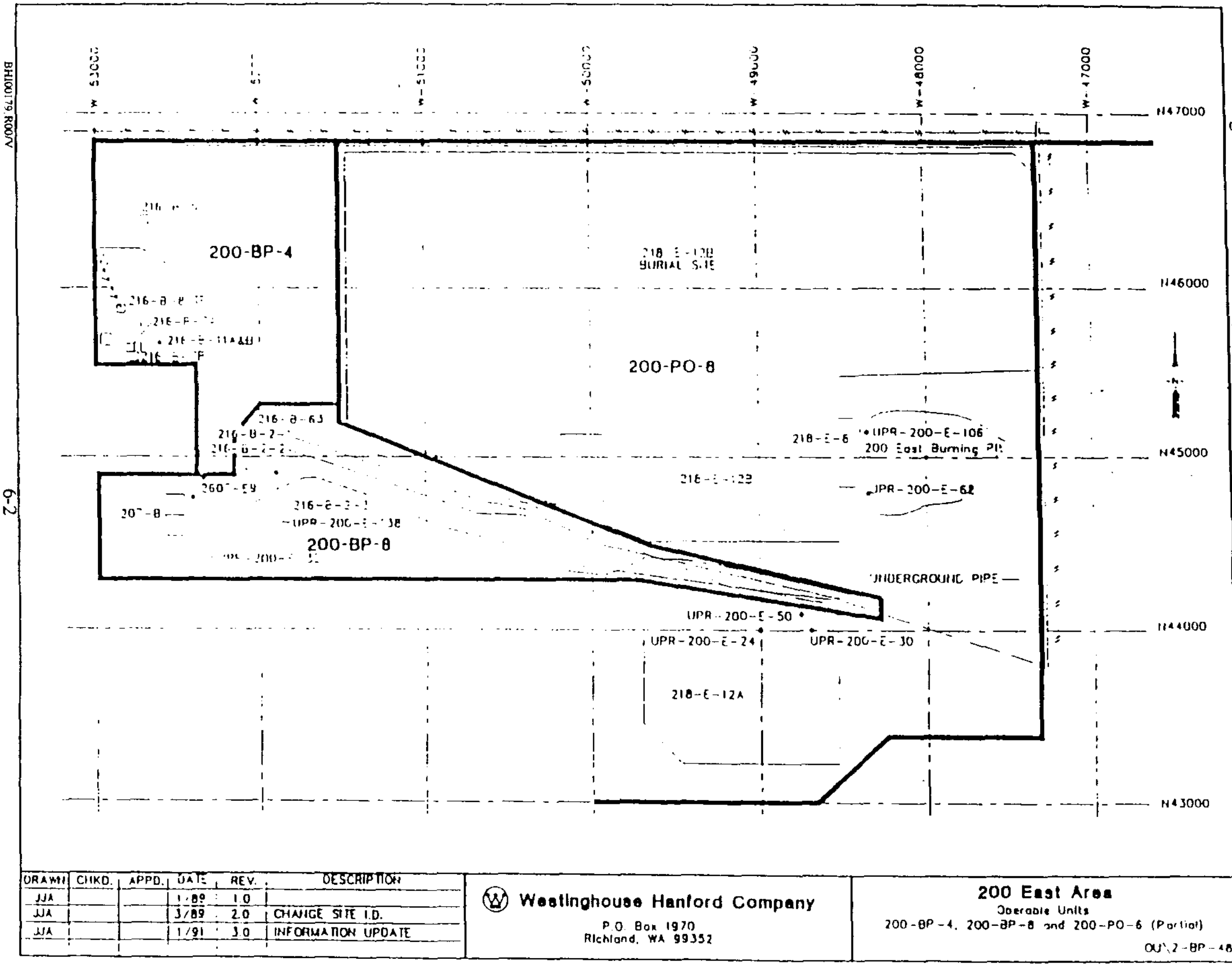


Figure 6-1. Location Map for Operable Units 200-BP-4, 200-BP-8, and 200-PO-6 (partial).

Table 6-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-4.

Site	Type of Site	Status	Coordinates	Type of Waste
216-B-11A & B	Reverse Well	Inactive	N45674 W52619, N45734 W52619 (center)	Mixed Waste
216-B-51	French Drain	Inactive	N46366 W52567 (center)	Mixed Waste
216-B-7A & B	Crib	Inactive	N45602 W52764 (center of A), N45648 W52790 (center of B)	TRU-Contaminated Soil Site/Mixed
216-B-81F	Crib	Inactive	N45880 W52840 (center), N45880 W52840, N46143 W52695 (tile field)	Mixed Waste

Table 6-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-4.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam. Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-B-11A & B	Liquid	December 1951	December 1954		Bot	0	0	40	26	29600000	47.82	
216-B-51	Liquid	January 1956	January 1958		Top	0	0	0	0	1000	0.71	
216-B-7A & B	Liquid	October 1946	May 1967		Top	0	0	14	430	43600000	65.44	
216-B-8TF	Liquid	April 1948	July 1953		Top	0	0	23	4500	27200000	1.42	

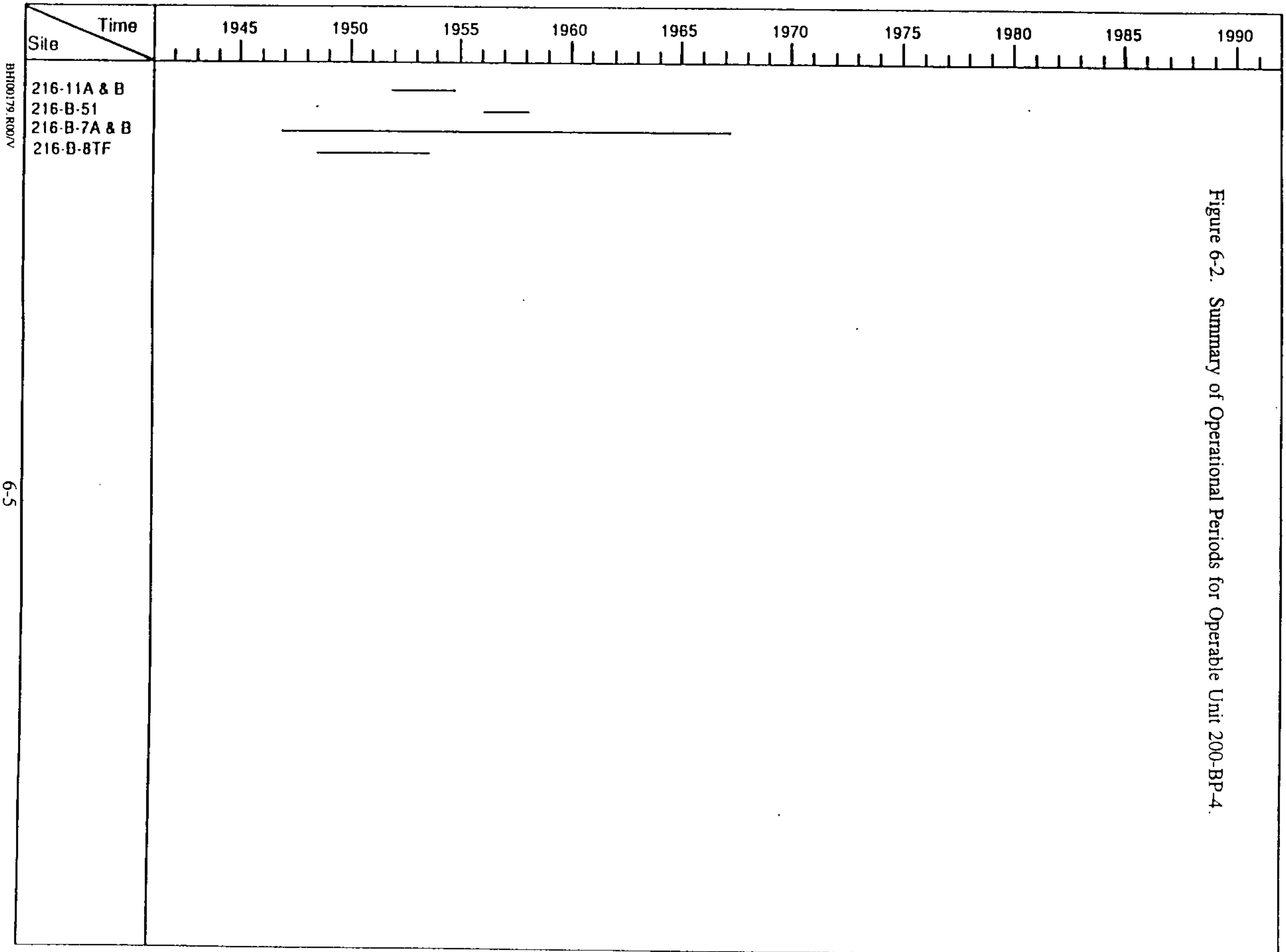


Figure 6-2. Summary of Operational Periods for Operable Unit 200-BP-4.

Table 6-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-4.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con (sq ft)	Rad Zone (sq ft)
216-B-11A & B	Light Chain	Surface Contamination	Could not determine	Gravel/Soil Cover	1.0	None	None	4270	4270
216-B-51	Light Chain	Surface Contamination	Could not determine	Gravel/Soil Cover	1.0	None	None	100	100
216-B-7A & B	Light Chain	Surface Contamination	Could not determine	Gravel/Soil Cover	1.0	None	None	2000	2000
216-B-8TF	Light Chain	Surface Contamination	Could not determine	Gravel/Soil Cover	1.0	None	None	625	625

Table 6-4. Inorganic and Organic Contaminant Identified at Sites Within Operable Unit 200-BP-4.

Site	Fluoride (kg)	FeCN (kg)	NH4NO3 (kg)	Potassium (kg)	Sodium (kg)	SulfAcid (kg)	Oxylate (kg)	Na Oxalate (kg)	NH4NO3 (kg)	Nitrite (kg)	Nitrate (kg)	Phosphate (kg)	Sulfamic Acid (kg)
216-B-5)	0	0	0	0	80	0	0	0	0	0	190	8	11
216-B-7 A &	240000	0	22000	400000	1600000	0	60000	0	22000	0	1800000	130000	15000
216-B-8TF	25000	0	160000	40000	900000	0	6000	0	160000	0	1400000	500000	70000

6.2 216-B-8TF CRIB AND TILE FIELD

The crib and tile field is an inactive waste site located about 350 ft north of 241-B tank farm (Hanford photographs A-15 and A-15). The unit was connected to the 241-B-110, 241-B-111, and 241-B-112 cascade series tanks of the 241-B tank farm and received about 27,200,000 L of waste between April 1948 and July 1953. Waste types included second-cycle waste supernatant from the 221-B building until July 1951, cell drainage and other liquid waste from tank 5-6 in the 221-B building in addition to second-cycle supernatant from July 1951 until December 1951, and decontamination and cleanup waste generated during the shutdown of 224-B from December 1951 to December 1952 (Stenner et al. 1988; Brown et al. 1990).

The 216-B-8 crib and tile field was taken out of service after sludge was inadvertently discharged to the crib from the 241-B-104 tank in August 1948. A sudden decrease in crib capacity led to the discovery that approximately 0.4 m of sludge had accumulated in the crib. The radioactive contaminant levels in the sludge were three orders of magnitude greater than the contaminant levels of the 241-B-104 tank liquid supernate. Highly permeable sediments conducted radioactive contaminants leached from the sludge downward and laterally beneath the crib. This explains the distribution of contamination beneath the 216-B-8 crib as evidenced by the scintillation probe profiles measured in 1976 (Fecht et al. 1977).

Vadose wells 299-E33-16, 299-E33-66, 299-E33-67, 299-E33-68, 299-E33-69, 299-E33-70, 299-E33-71, 299-E33-72, and 299-E33-89 monitor the soil beneath the crib site. Scintillation probe profiles indicate groundwater contamination has not occurred beneath this site (Fecht et al. 1977).

6.3 216-B-11A AND 216-B-11B REVERSE WELLS

This is an inactive waste site located about 250 north of the 241-B tank farm. There are two underground injection wells placed about 60 ft apart in line with a 3-in. steel inlet pipe (Hanford photograph A-16). From December 1951 to December 1954, about 29,600,000 L of low salt, neutral to basic process condensate from the 242-B evaporator were disposed at this facility. Radionuclides entrained in the waste stream include: cesium-137, ruthenium-106, strontium-90, plutonium, and uranium (Brown et al. 1990).

The site was deactivated when it became evident that cribs and trenches were a more effective means of disposal. The supply lines were blanked and capped in the B building.

Vadose wells 299-E-20 and 299-E-19 monitor the soil column beneath the site. Scintillation probe profiles indicate breakthrough to groundwater has not occurred at this site (Fecht et al. 1977).

6.4 216-B-51 FRENCH DRAIN

This is an inactive waste site located about 750 ft north of the 241-B tank farm (Hanford photograph A-17). The drain received about 1,000 L of flush drainage from the BC crib pipeline. The pipeline carried high-salt neutral to basic scavenged TBP waste from the 221-U building to the BC crib area. The site contains less than 10 Ci of total beta activity (Cramer 1987; Stenner et al. 1988).

Monitoring wells 299-E33-11 and 299-E33-14 monitor the groundwater beneath the site. Based on scintillation probe profiles and estimated waste inventory, groundwater contamination has not occurred at this site (BHI 1994; Stenner et al. 1988). A radionuclide inventory for this site was not available (BHI 1994). It is assumed that the same radionuclides disposed at the BC site were also disposed at this waste site (Fecht et al. 1977).

7.0 OPERABLE UNIT 200-BP-5

There are 11 sites in this operable unit located near the center of the 200 East Area, sandwiched between B Plant and the semiworks facility (Figures 1-1 and 7-1). Of the 11 sites, only one, reverse well 216-B-5, with a disposed waste volume of 30,600,000 L, scored high on the migration hazard evaluation (Stenner et al. 1988). The other sites, two cribs, a diversion box, catch tank, settling tank, three UPRs, and two active retention basins were either not evaluated or scored very low. Of these sites, the 216-B-9TF crib was the only site to receive a larger quantity of waste than the 216-B-5 reverse well. In addition, crib 216-B-56 was never used.

The operational history of this operable unit spans the 40 yr between 1945 and 1985. Low-level, mixed, and TRU-contaminated soil waste have been disposed in Operable Unit 200-BP-5.

Table 7-1 provides site locations and waste types for Operable Unit 200-BP-5. A graphical summary of the operational history of the individual sites is presented in Figure 7-2. The starting and stopping dates for each site are listed in Table 7-2. Table 7-3 provides a summary of current site conditions based on several site visits performed by the authors during September and October 1991. A list of the organic and inorganic contaminants that were part of the waste disposed in the area is given in Table 7-4. This data was extracted from BHI (1994) and has not been validated by the authors. It should be used as a guideline only.

7.1 216-B-5 REVERSE WELL

Well 216-B-5 is an inactive waste site located about 1,000 ft north northeast of B Plant east of Baltimore Road (Hanford photograph A-18). It received overflow waste from the 241-B-361 settling tank. Waste types disposed in this well include liquid waste from the 224-B building and from tank 5-6 in the 221-B building until September 1946. Between September 1946 and October 1947, cell drainage and other liquid waste from tank 5-6 was injected into the well (Cramer 1987; Brown et al. 1990).

Monitoring well 299-E28-7 monitors groundwater in the vicinity of the site. In 1947 the elevation of the water table in well 299-E33-18 demonstrated that the reverse well penetrated about 3 m into the groundwater and that radioactive waste had been discharged into the groundwater. The site was deactivated and tank 5-6 wastes were rerouted to the 216-B-7A and 216-B-7B cribs. Eleven wells were drilled around the reverse well to determine the extent of groundwater contamination and was determined to contain less than 20 by 10^{-7} pCi/L and extended 600 m laterally from the well (Fecht et al. 1977).

The site was deactivated when groundwater contamination was detected and the waste diverted to the 216-B-7A and 216-B-7B cribs (Maxfield 1979).

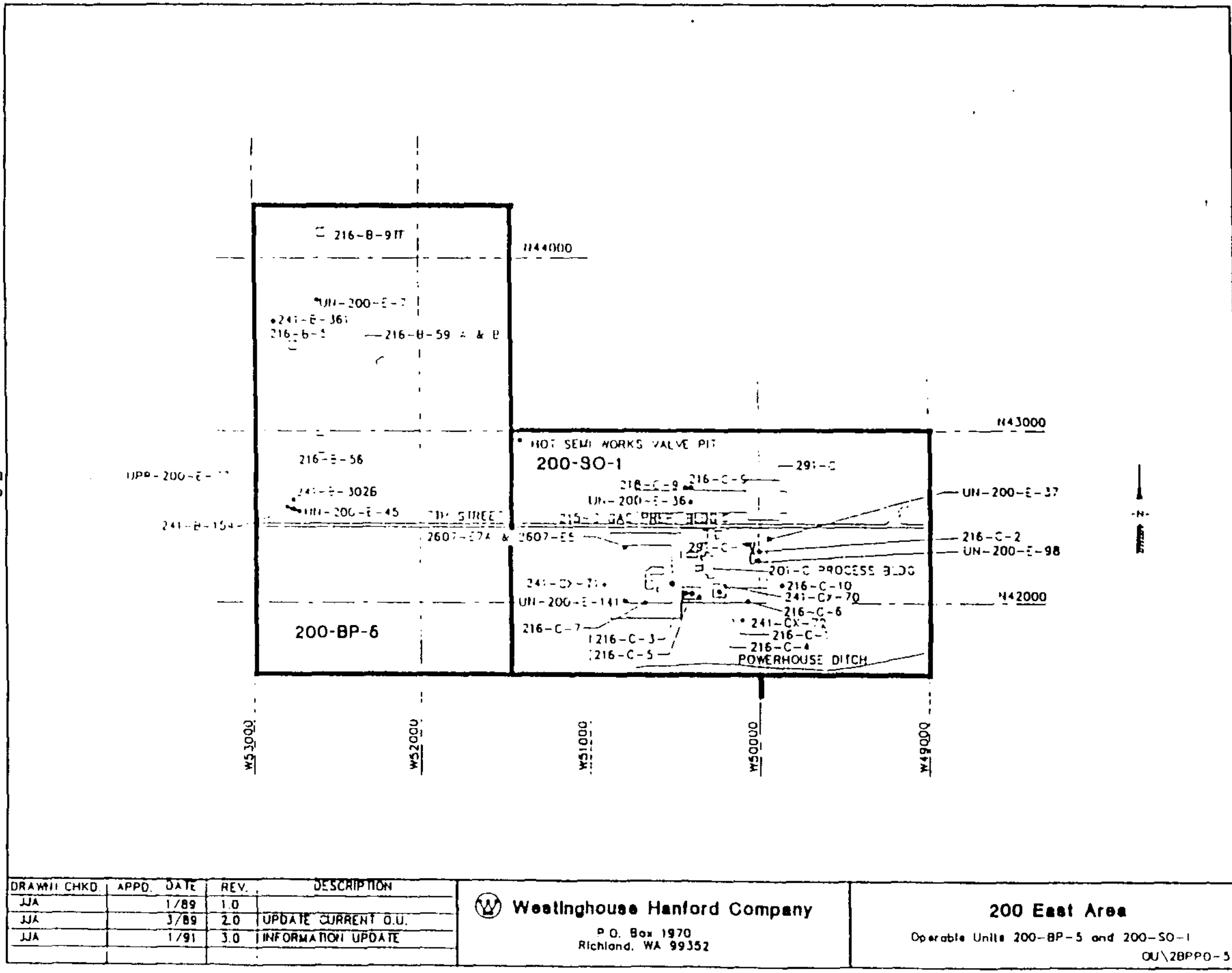


Figure 7-1. Location Map for Operable Unit 200-BP-5.

Table 7-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-5.

Site	Type of Site	Status	Coordinates	Type of Waste
216-B-5	Reverse Well	Inactive	N43480 W52855 (center)	TRU-Contaminated Soil Site/Mixed
216-B-56	Crib	Inactive	N42885 W52600, N42955 W52600	Nonhazardous/Nonradioactive
216-B-55	Retention Basin	Active	N43001 W52787, N43284 W52504 (centerline)	Mixed Waste
216-B-59B	Retention Basin	Active	N44600 W52500	Low-Level Waste
216-B-9TF	Crib	Inactive	N43757 W52617 (crib), N43764 W52575, N43764 W52660, N43951 W52660	Mixed Waste
241-B-154	Diversion Box	Inactive	N42543 W52756	Mixed Waste
241-B-302B	Catch Tank	Inactive	N42600 W52756	Mixed Waste
241-B-361	Settling Tank	Inactive	N43400 W52890	TRU-Contaminated Soil Site/Mixed
UN-200-E-45	Unplanned Release	Inactive	N42529 W52725	Mixed Waste
UN-200-E-7	Unplanned Release	Inactive	N43757 W52617	Mixed Waste
UPR-200-E-77	Unplanned Release	Inactive	N42550 W52800	Mixed Waste

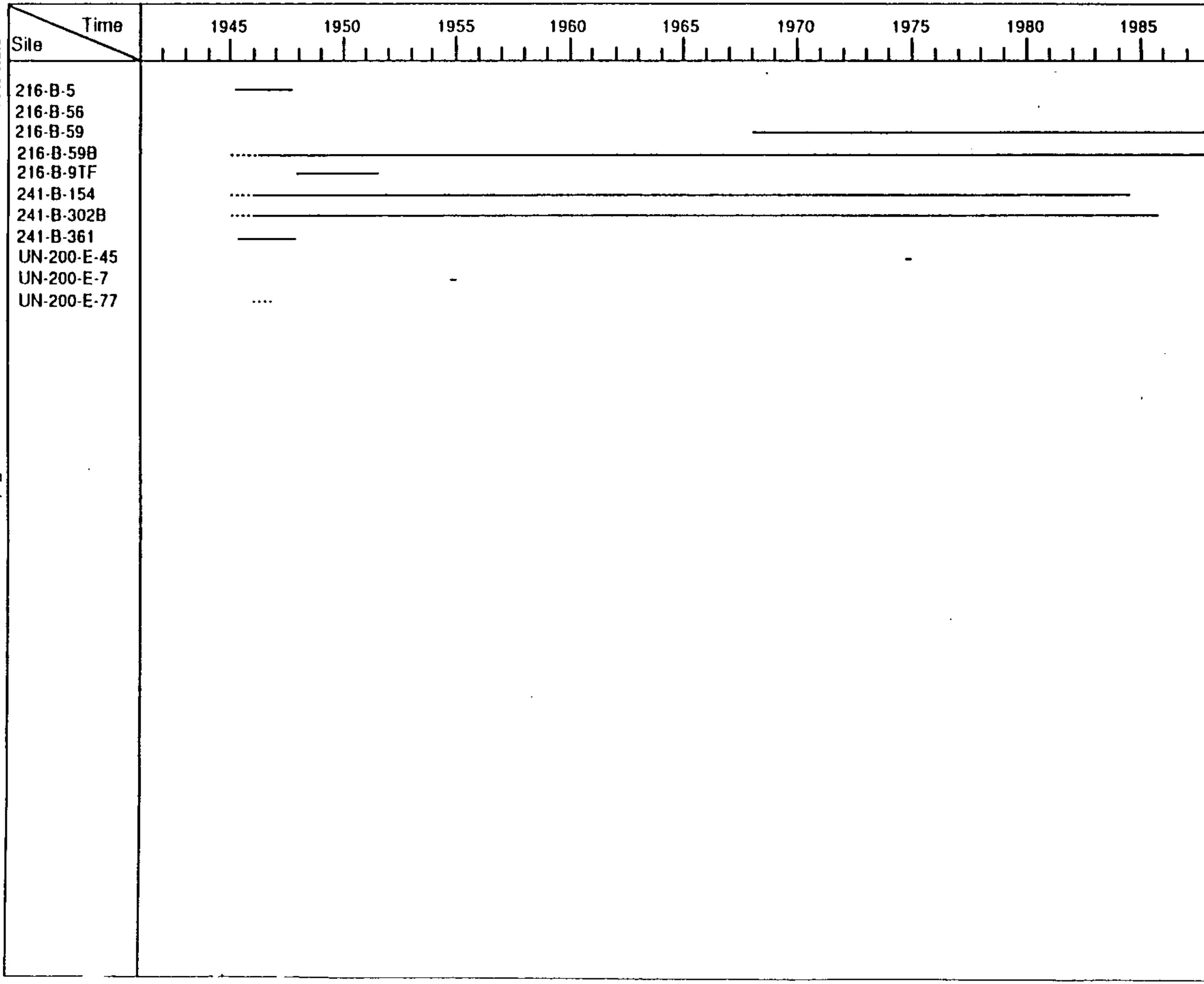


Figure 7-2. Summary of Operational Periods for Operable Unit 200-BP-5.

BHI00179.R00/V

Table 7-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-5.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-E-5	Liquid	April 1945	October 1947		Bot	0	0	302	160	30600000	60.40	
216-E-50	Liquid	Not Used	Not Used		Bot	70	10	0	0	0	0.00	
216-B-55	Liquid	December 1967	Active		Bot	400	20	12	250	477000	0.00	
216-E-59B	Liquid	1945	Active		Top	0	0	0	0	0	0.00	
216-E-91F	Liquid	August 1948	July 1951		Top	194	64	30	1600	36000000	1.04	
241-B-154	Liquid	1945	June 1984		Top	36	9	17	0	0	0.00	UPR-200-E-77
241-B-302B	Liquid	1945	July 1985		Top	0	0	0	0	0	0.00	
241-B-361	Liquid	April 1945	September 1947		Top	19	0	0	0	0	0.00	
UN-200-E-45	Liquid			August 26, 1974	Top	300	100	0.	0	0	1.14	
UN-200-E-7	Liquid			November 30, 1954	Top	30	30	0	0	18927	1.45	
UPR-200-E-77	Liquid			1946	Top	0	0	0	0	0	1.09	

Table 7-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-5.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad Zone (sq ft)
216-B-5	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Gravel/Soil Cover	1.0	None	None	675	675
216-B-56	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Gravel/Soil Cover	1.0	None	None	0	3045
216-B-59	Chain Link Fence	Underground Contamination	Posted on Structure	None/Unknown	-5.0	None	Inside Tank Farm	0	0
216-B-59B	Chain Link Fence	Underground Contamination	Posted on Structure-	None/Unknown	-5.0	None	Inside Tank Farm	0	0
216-B-91T	Light Chain	Surf +Underground Contam	Concrete Post w/ Plaque	Gravel/Soil Cover	1.0	Trace/Few Plants	None	16432	16432
241-B-154	Light Chain	Surface Contamination	None	Sprayed Plastic Foam	1.0	None	None	0	0
241-B-302B	Light Chain	Surface Contamination	None	Gravel/Soil Cover	1.0	None	None	0	0
241-B-361	Light Chain	Surf +Underground Contam	None	Gravel/Soil Cover	1.0	None	None	0	0
UN-200-E-7	None	None	None	None/Unknown	0.0	Brush/Grass	None	0	0

Table 7-4. Inorganic and Organic Contaminants Identified at Sites Within Operable Unit 200-BP-5.

Site	Fluoride (kg)	FeCN (kg)	HNO3 (kg)	Potassium (kg)	Sodium (kg)	SulfAcid (kg)	Oxylate (kg)	Na Oxalate (kg)	Al Nitrate (kg)	Nitrite (kg)	Nitrate (kg)	Phosphate (kg)	Sulfamic Acid (kg)
216-B-5	50000	0	0	80000	350000	0	12000	0	5000	0	400000	29000	3300
216-B-9TF	0	0	0	0	0	0	0	0	0	0	1000	0	0

7.2 216-B-9TF CRIB AND TILE FIELD

This is an inactive waste site located along Baltimore Avenue approximately 1,250 ft south of the 241-B tank farm (Hanford photograph A-19). Between August 1948 and July 1951, the site received about 36,000,000 L of cell drainage and tank 5-6 liquid wastes from the 221-B building. In August 1948, the 216-B-9 crib and tile field were connected to the waste line from the 221-B building when the 216-B-5 injection well was deactivated. Suspended solids with significantly higher radionuclide concentrations contained in the waste stream formed sludge in the crib significantly decreasing its volume and allowing unsettled sludge to discharge to the tile field resulting in surface contamination. The BHI (1994) Hazardous Chemical Inventory lists only 1,000 kg of nitrate contained within the waste stream. Radionuclides include: cesium-137, ruthenium-106, strontium-90, plutonium, uranium, and TRU elements. The site was deactivated by disconnecting the supply line from the 241-B-154 diversion box when the calculated specific retention of the underlying soil column was achieved (Maxfield 1979; Cramer 1987; Brown et al. 1990).

Vadose wells 299-E28-53, 299-E28-54, 299-E28-55, 299-E28-61, and 299-E28-1, 299-E28-5, 299-E28-6, 299-E28-56, 299-E28-57, 299-E28-58, and 299-E28-60 are used to monitor radionuclide concentration in the soil beneath the crib and the tile field, respectively. Scintillation probe profiles suggest the contaminants are suspended near the surface in the sediment column and have not contaminated groundwater (Fecht et al. 1977).

7.3 216-B-56 CRIB

The 216-B-56 crib, located approximately 500 ft north of 7th Street near the center of the operable unit (Hanford photograph A-20), was designed to receive organic wastes from 221-B building but the pipeline to the unit was not installed when disposal practices were changed and discharge of organic wastes to the ground was prohibited (Lundgren 1979; Maxfield 1979).

Vadose well 299-E28-14 monitors the soil column beneath the site. Scintillation probe profiles indicate only background activity levels (Fecht et al. 1977).

BHI (1994) indicates the site had to be stabilized due to cross-contamination from surrounding sites.

7.4 216-B-59/59B TRENCH/RETENTION BASIN

Centered approximately 750 ft north of 7th Street the 216-B-59 trench was designed to receive B Plant cooling water with radionuclide concentrations above those allowed for the existing ponds. The site was activated in December 1967 and only received a single delivery of approximately 477,000 L of waste. The trench was upgraded to a retention basin adding a hypalon liner and changing the identification number to 216-B-59B. The retention basin held diverted cooling water for subsequent reprocessing. The retention basin was upgraded by replacing the hypalon liner with a concrete liner and cover. In addition, minor pumping and piping modifications were made. The site is currently active receiving diverted wastes for reprocessing (Request for Determination of Safety Analysis Requirements, July 22, 1983; BHI 1994).

The site is surrounded by a 6-ft-high chain link fence. Yellow contamination flags are adjacent to the western boundary. The concrete retention basin is about 30 ft wide, 120 ft long, and 10 ft deep, and is situated in a 100-ft by 200-ft by 15-ft deep excavation. The excavation has a gravel sub-base beneath the retention basin and the top of the basin is about 5 ft below grade (Hanford photograph A-21). No vegetation was observed within the fenced perimeter during a site visit in 1991, and signs warning of surface contamination are posted on the fence (site visit by authors, September 1991).

7.5 241-B-154 DIVERSION BOX, 241-B-302-B CATCH TANK, AND UPR-200-E-77

Diversion box 241-B-302B is located on the northeast corner of Baltimore Avenue and 7th Street. The site, in service from 1945 to June 1984, was used to transfer various types of waste solutions from processing and decontamination operations to disposal sites. The site interconnects 241-B-151 and 241-B-152 diversion boxes and 221-B building (Cramer 1987).

Situated adjacent to and at a lower elevation than the diversion box is the 241-B-302-B catch tank, which collects waste spilled in the diversion box during transfers (Cramer 1987).

In 1946 UPR-200-E-77 resulted when a leaky jumper in the diversion box allowed metal solution waste to escape and contaminate the surrounding soil with approximately 1 Ci of fission products. The contamination was covered with at least 1 ft of clean soil and the area was enclosed with a wire fence and posted as a radiation zone (Maxfield 1973; Stenner et al. 1988).

The site has been isolated and stabilized by application of a weather-proofing plasticizer. The ground surface is covered with gravel and there is no vegetation. At the western edge of the site, there is a manhole with a radiation warning sign on the cover (Kiser 1988; site visit by authors, September 1991).

7.6 241-B-361 SETTLING TANK

This inactive waste site is located about 600 ft northeast of B Plant on the east side of Baltimore Avenue. The settling tank was in operation from April 1945 to September 1947, receiving low-salt alkaline radioactive waste from cell washings collected in the 5-6W cell in the 221-B building and additional waste from the 224-B building. Overflow from this tank was injected to the 216-B-5 reverse well. An estimated 32,000 gal of sludge, consisting primarily of bismuth phosphate, with about 2.46 kg of plutonium is contained in the tank (Crusselle and Romano 1982).

Although this site was interim stabilized in 1985, the release potential for radiological hazard rates are high in comparison to other 200 Area waste sites (Cramer 1987; Hanlon 1990; BHI 1994).

7.7 UN-200-E-7 UNPLANNED RELEASE

A leak in the waste line from the 221-B building to the 241-B-361 diversion box released approximately 19,000 L of cell wash water from tank 5-9 in the region near the 216-B-9 crib and tile field on November 30, 1954. The maximum observed dose rate was 1.7 R/h. The contaminated was surrounded with a chain fence and underground contamination warning signs (Baldridge 1959).

At the present time, the 216-B-9 crib is delimited with a light-weight chain barricade and a recent excavation approximately 100 ft south of the crib has been stabilized. No indicators marking the location of UN-200-E-7 UPR were seen (site visit by authors, October 1991)

7.8 UN-200-E-45 UNPLANNED RELEASE

Unplanned release UN-200-E-45 occurred at the 241-B-154 diversion box on August 26, 1974. Mixed waste with beta and gamma readings up to 50,000 c/m flowed from the diversion box across 7th Street contaminating an area 300 ft long and 100 ft wide. The roadway was washed with water and the contaminated soil removed and placed in a burial trench (Stenner et al. 1988; BHI 1994). No indicators marking the location of UN-200-E-45 were seen (site visit by authors, October 1991).

8.0 OPERABLE UNIT 200-BP-6

Operable Unit 200-BP-6 incorporates the area immediately surrounding B Plant (Figures -1 and 8-1). A graphical summary of the operational history of the individual sites is presented in Figure 8-2. Table 8-1 provides a site location and waste type summary table for Operable Unit 200-BP-6 and detailed dates for each site are listed in Table 8-2.

Thirty five sites form this operable unit. They include two active septic tanks, a staging area, and an active diversion box. There are also 16 UPRs, three inactive cribs, an inactive french drain, two inactive reverse wells, and nine other sites (Table 8-1). Two of the sites, staging area 226-B-HWSA and UN-200-E-140, consists of hazardous waste, and UN-200-E-87 consisted of TRU waste, while the remainder of the sites contain either mixed waste or nonhazardous/nonradioactive waste. Only three sites, crib 216-B-10A and the two reverse wells, had significantly high scores on the PNL migration Hazard Ranking System (Stenner et al. 1988).

Table 8-3 provides a summary of current site conditions based on several site visits performed by the authors during the September through November 1991 time period. Only five of the sites were reported to contain any organic or inorganic contaminants (Table 8-4; BHI 1994).

8.1 216-B-4 REVERSE WELL

The site consists of a reverse well located about 800 ft southeast of the 221-B building, west of the 292-B building. The structure received 10,000 L of low-salt, neutral/basic, TRU fission waste during its operational lifetime of April 1945 through December 1949. Until August 1947, the site received 291-B stack drainage. After August 1947, the site received floor drainage from the 292-B building. The BHI (1994) Hazardous Chemical Inventory lists only 1,000 kg of nitric acid contained in the waste stream. A radionuclide inventory was not available. The pipeline to the unit has been disconnected (Harmon et al. 1975; Lundgren 1979; Stenner et al. 1988).

A depression in the soil 8 ft from the marker could be due to the collapse of the plywood cover installed on top of the two 4-ft-diameter, 5-ft-long vitrified clay pipes (VCP) placed vertically end to end (Hanford photograph A-22) (Hanford drawing H-2-2926; site visit by authors, October 1991).

8.2 216-B-6 REVERSE WELL

The 216-B-6 reverse well is located 12 ft west and 3 ft north of the northwest corner of the 222-B Building. It is marked by a 4-ft concrete identification post. The vent pipe is cut below grade. Hanford photograph A-23 depicts the identification post and the area around it (Doud 1959; DOE-RL 1988).

Six million liters of mixed liquid waste was received by the well during the period April 1945 through December 1949. The waste was acidic (containing nitric and sulfuric acid) and radioactive (containing TRU fission products).

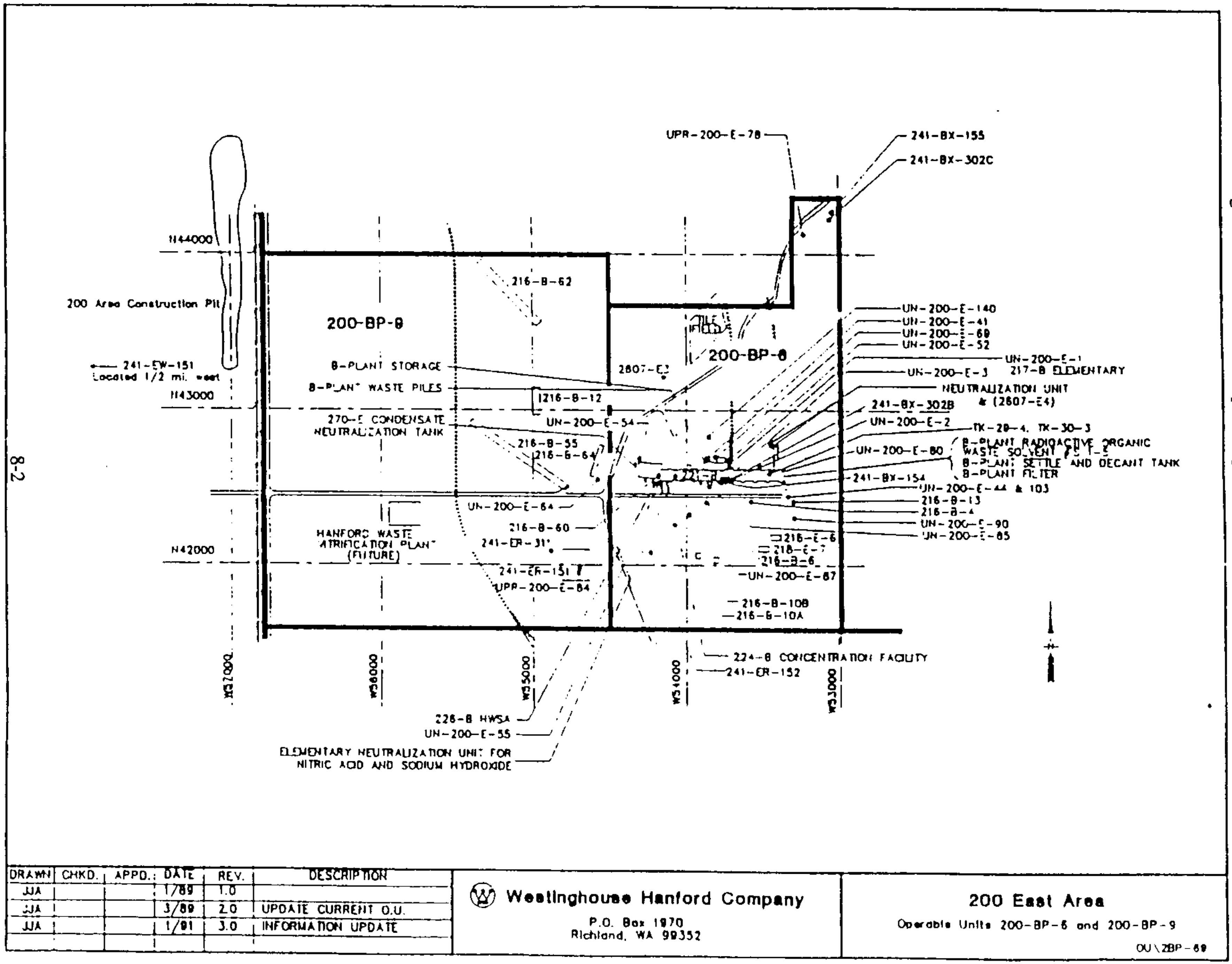


Figure 8-1. Location Map for Operable Units 200-BP-6 and 200-BP-9.

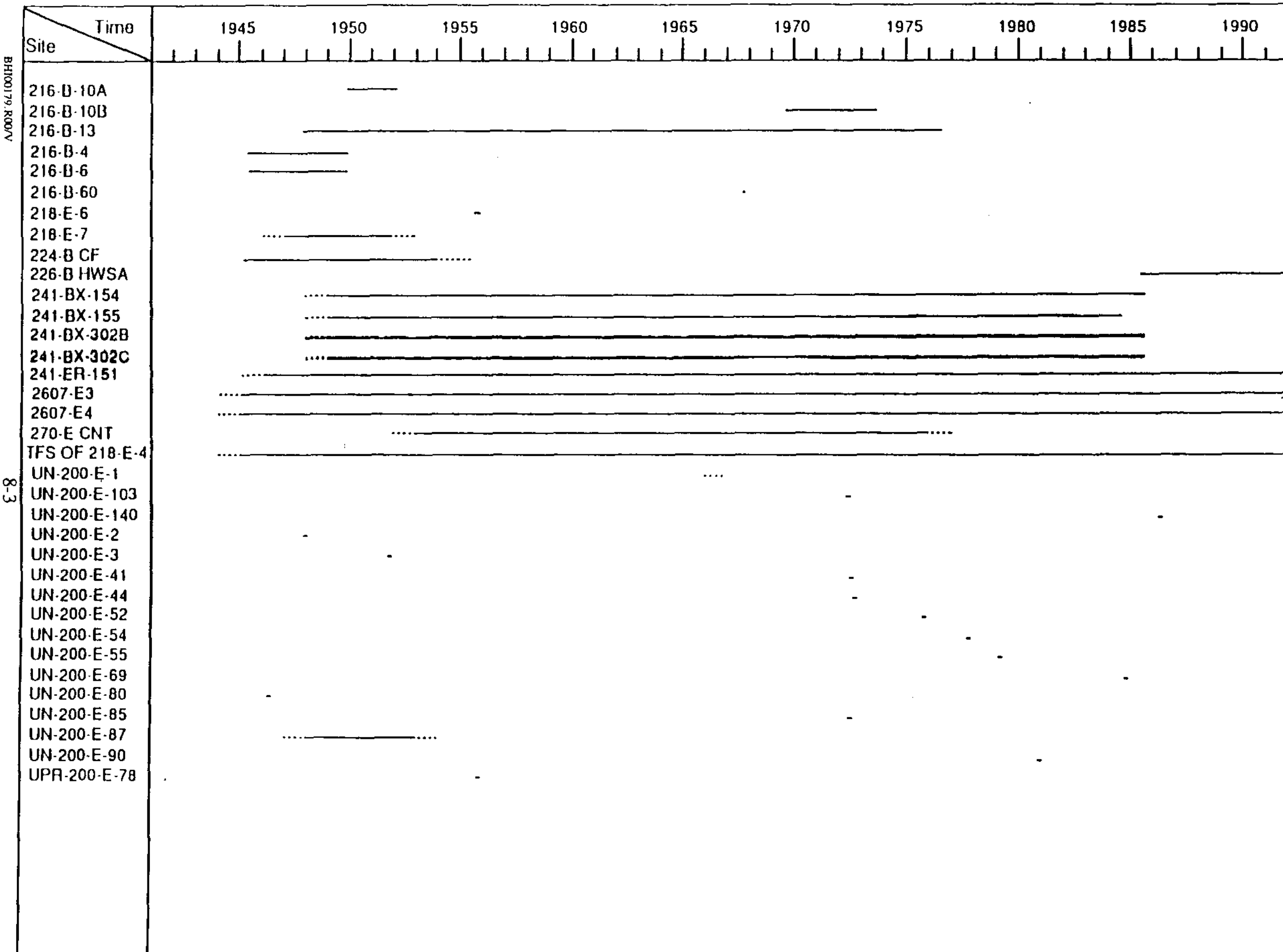


Figure 8-2. Summary of Operational Periods for Operable Unit 200-BP-6.

Table 8-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-6.

Site	Type of Site	Status	Coordinates	Type of Waste
216-B-10A	Crib	Inactive	N42195 W53868 (center)	Mixed Waste
216-B-10B	Crib	Inactive	N42195 W53943 (center)	Mixed Waste
216-B-13	French Drain	Inactive	N42336 W53547 (center)	Mixed Waste
216-B-4	Reverse Well	Inactive	N42363 W53603 (center)	Mixed Waste
216-B-6	Reverse Well	Inactive	N42403 W53870 (center)	Mixed Waste
216-B-60	Crib	Inactive	N42573 W54178, N42583 W54178 (centerline)	Mixed Waste
218-E-6	Burial Ground	Inactive	N42225 W53360	Nonhazardous/Nonradioactive
218-E-7	Burial Ground	Inactive	N42269 W53826 (Vault 1), N42269 W53806 (Vault 2),	Mixed Waste
224-B CF	Test Treatment or Support	Inactive	N42270 W54040	Mixed Waste
226-B IWSA	Staging Area	Active	N42520 W54210	Hazarous Waste
241-BX-154	Diversion Box	Inactive	N42527 W53759	Mixed Waste
241-BX-155	Diversion Box	Inactive	N44230 W53222	Mixed Waste
241-BX-302B	Catch Tank	Inactive	N42540 W53800	Mixed Waste
241-BX-302C	Catch Tank	Inactive	N44210 W53186	Mixed Waste
241-ER-152	Diversion Box	Active	N42081 W54238	Mixed Waste
2607-E3	Septic Tank	Active	N43200 W54150	Nonhazardous/Nonradioactive
2607-E4	Septic Tank	Active	N42750 W53450	Nonhazardous/Nonradioactive
270-E CNT	Neutralization Tank	Inactive	N42600 W54400	Mixed Waste
TFS OF 218-E-4	Drain Field	Inactive	N43500 W53850	Mixed Waste
UN-200-E-1	Unplanned Release	Inactive	N42535 W53780	Mixed Waste
UN-200-E-103	Unplanned Release	Inactive	N42450 W53350	Mixed Waste
UN-200-E-140	Unplanned Release	Inactive	N42800 W54180	Hazardous Waste
UN-200-E-2	Unplanned Release	Inactive	N42550 W53700	Mixed Waste
UN-200-E-3	Unplanned Release	Inactive	N42550 W53750	Mixed Waste
UN-200-E-41	Unplanned Release	Inactive	N42675 W53875	Mixed Waste
UN-200-E-44	Unplanned Release	Inactive	N42450 W53350	Mixed Waste
UN-200-E-52	Unplanned Release	Inactive	N42650 W53750	Mixed Waste
UN-200-E-54	Unplanned Release	Inactive	N42675 W54325	Mixed Waste
UN-200-E-55	Unplanned Release	Inactive	N42525 W54200	Mixed Waste
UN-200-E-69	Unplanned Release	Inactive	N42675 W53825	Mixed Waste
UN-200-E-80	Unplanned Release	Inactive	N42575 W53450	Mixed Waste
UN-200-E-85	Unplanned Release	Inactive	N42500 W53850	Mixed Waste
UN-200-E-87	Unplanned Release	Inactive	N42325 W53980	TRU/Mixed Waste
UN-200-E-90	Unplanned Release	Inactive	N42300 W53300	Mixed Waste
UPR 200-E-78	Unplanned Release	Inactive	N44200 W53200	Mixed Waste

Table 8-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-6.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-B-10A	Liquid	December 1949	January 1952		Bot	14	14	20	45	9990000	47.82	
216-B-10B	Liquid	June 1969	October 1973		Bot	14	14	20	45	28000	1.04	
216-B-13	Liquid	August 1947	June 1976		Top	0	0	18	0	21000	0.71	
216-B-4	Liquid	April 1945	December 1949		Top	0	0	110	0	10000	47.82	
216-B-6	Liquid	April 1945	December 1949		Top	0	0	75	0	6000000	50.34	
216-B-60	Liquid	November 1967	November 1967		Top	0	0	40	67	18900	0.98	
218-E-6	Solid	Fall 1955	Fall 1955		Top	0	0	0	0	0	0.00	
218-E-7	Solid	1947	1952		Top	0	0	0	1456	170	0.65	
224-B CF	Solid	April 1945	Cerca 1954		Top	0	0	0	0	0	0.00	
226-B HWSA	Liquid	May 30, 1985	Active		Top	0	0	0	0	0	0.00	
241-BX-154	Liquid	1948	July 1985		Top	22	9	0	0	0	0.00	
241-BX-155	Liquid	1946	June 1984		Top	20	9	0	0	0	0.00	UPR-200-E-78
241-BX-302B	Liquid	1946	July 1985		Top	0	0	0	0	0	0.00	
241-BX-302C	Liquid	1946	July 1985		Top	0	0	0	0	0	0.00	
241-ER-152	Liquid	1945	Active		Top	0	0	0	0	0	0.00	
2607-E3	Liquid	1944	Active		Top	21	9	0	0	0	0.00	
2607-E4	Liquid	1944	Active		Top	4	2	0	0	0	0.00	
270-E CNT	Liquid	1952	1976		Top	0	0	0	0	0	0.00	
TFS OF 216-E-4	Liquid	1944	Active		Top	0	0	0	0	0	0.00	
UN-200-E-1	Liquid			1966	Top	0	0	0	0	0	0.00	
UN-200-E-103	Liquid			March 8, 1972	Top	0	0	0	0	0	0.00	
UN-200-E-140	Liquid			April 23, 1986	Top	0	0	0	0	8	0.00	
UN-200-E-2	Liquid			November 18, 1947	Top	0	0	0	0	0	0.00	
UN-200-E-3	Liquid			November 21, 1951	Top	0	0	0	0	0	1.09	
UN-200-E-41	Liquid			July 19, 1972	Top	0	0	0	0	0	0.00	
UN-200-E-44	Liquid			August 16, 1972	Top	0	0	0	0	0	0.00	
UN-200-E-52	Liquid			August 1, 1975	Top	4	4	4	0	0	0.98	
UN-200-E-54	Liquid			July 20, 1977	Top	0	0	0	0	0	1.04	
UN-200-E-55	Solid			April 27, 1979	Top	100	100	1	0	0	0.84	
UN-200-E-69	Liquid			June 19, 1984	Top	0	0	0	0	0	0.00	
UN-200-E-80	Liquid			June 17, 1946	Top	500	100	0	0	0	1.20	
UN-200-E-85	Liquid			July 20, 1972	Top	50	50	15	0	0	1.14	
UN-200-E-87	Liquid			1945 to 1953	Top	15	15	0	260	0	1.04	
UN-200-E-90	Solid			September 1980	Top	0	0	0	0	0	0.00	
UPR-200-E-78	Liquid			October 1955	Top	200	200	0	0	0	1.04	

Table 8-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-6.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad. Zone (sq ft)
216-B-10A	Light Chain	Underground Contamination	Concrete Post w/ Plaque	None/Unknown	1.0	None	None	0	1500
216-B-10B	Light Chain	Underground Contamination	Concrete Post w/ Plaque	None/Unknown	1.0	None	None	0	1500
216-B-13	Light Chain	Surf.+Underground+Cave-in	Concrete Post w/ Plaque	None/Unknown	0.0	None	None	10	10
216-B-4	None	Underground Contamination	Concrete Post w/ Plaque	None/Unknown	0.0	None	None	0	10
216-B-6	None	Underground Contamination	Concrete Post w/ Plaque	None/Unknown	0.0	None	None	0	10
216-B-60	Bldg 225-B rope	None	None	None/Unknown	0.0	None	Cover/Bldg 225-B	0	0
218-E-6	None	None	None	Gravel/Soil Cover	0.0	None	None	0	0
218-E-7	Light Chain	Surf.+Underground+Cave-in	None	Gravel/Soil Cover	0.0	Brush/Grass	None	0	0
224-B CONC FAC	None	None	None	None/Unknown	0.0	None	None	0	0
226-B NWSA	Light Chain	PCB 30 Day Storage	Metal Post with Plaque	None/Unknown	0.0	None	None	0	0
241-BX-154	Light Chain	Surface Contamination	None	Sprayed Plastic Foam	1.0	Trace/Few Plants	None	0	0
241-BX-155	Light Chain	Surface Contamination	None	Sprayed Plastic Foam	1.0	None	None	0	0
241-BX-302B	Chain Link Fence	Surf.+Underground Contam.	None	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-302C	Chain Link Fence	Surf.+Underground Contam.	None	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-ER-152	Light Chain	Surface Contamination	None	Sprayed Plastic Foam	1.0	None	Inside Tank Farm	0	0
2607-E3	Light Chain	Sani. Sewer Drainfield	Sani. Sewer Drain Field	None/Unknown	0.0	Cattails/Brush/Grass	None	0	0
2607-E4	Light Chain	Underground Contamination	Sani. Sewer Drain Field	None/Unknown	0.0	Brush/Grass	None	0	0
270-E C.N.T.	Light Chain	Surface Contamination	Could not determine	None/Unknown	0.0	Brush/Grass	None	0	0
1.F.S. 218-E-4	Light Chain	Sani. Sewer Drainfield	Sani. Sewer Drain Field	None/Unknown	-5.0	Brush/Grass	None	0	0
UN-200-E-1	None	None	None	None/Unknown	0.0	None	could not locate	0	0
UN-200-E-103	Light Chain	Radioactive Material	None	None/Unknown	0.0	None	could not locate	0	0
UN-200-E-140	None	None	None	None/Unknown	0.0	None	could not locate	0	0
UN-200-E-2	Light Chain	Surface Contamination	None	Gravel/Soil Cover	0.0	None	could not locate	0	0
UN-200-E-3	Light Chain	Surface Contamination	None	None/Unknown	0.0	Trace/Few Plants	None	0	0
UN-200-E-41	None	None	Could not determine	Could Not Determine	0.0	None	Inside Building	950000	950000
UN-200-E-44	Light Chain	Radioactive Material	None	None/Unknown	0.0	None	could not locate	105570	1055700
UN-200-E-45	None	None	None	None/Unknown	0.0	Trace/Few Plants	could not locate	0	0
UN-200-E-52	None	None	Could not determine	Could Not Determine	0.0	None	Inside Building	0	0
UN-200-E-54	None	Radioactive Material	None	None/Unknown	0.0	None	None	0	0
UN-200-E-55	None	None	None	None/Unknown	0.0	Trace/Few Plants	could not locate	0	0
UN-200-E-69	None	None	None	None/Unknown	0.0	Brush/Grass	None	0	0
UN-200-E-80	Light Chain	Surface Contamination	None	Gravel/Soil Cover	2.0	None	None	0	0
UN-200-E-85	Light Chain	Surface Contamination	None	None/Unknown	0.0	None	None	0	0
UN-200-E-87	Light Chain	Underground Contamination	None	Gravel/Soil Cover	0.0	Trace/Few Plants	None	0	0
UN-200-E-90	Light Chain	Surface Contamination	None	Gravel/Soil Cover	1.0	None	could not locate	0	0

Table 8-4. Inorganic and Organic Contaminants Identified at Sites Within Operable Unit 200-BP-6.

Site	Fluoride (kg)	FeCN (kg)	HNO3 (kg)	Potassium (kg)	Sodium (kg)	SulfAcid (kg)	Oxylate (kg)	Na Dichromate (kg)	NitricAcid (kg)	Nitrite (kg)	Nitrate (kg)	Phosphate (kg)	Sulfamic Acid (kg)
216-B-10A	0	0	1000	0	0	0	0	100	1000	0	1000	0	1000
216-B-10B	0	0	2	0	0	0	0	0	2	0	0	0	0
216-B-13	0	0	0	0	0	0	0	0	0	0	2000	0	0
216-B-4	0	0	1000	0	0	0	0	0	1000	0	0	0	0
216-B-6	0	0	10000	0	0	0	0	100	10000	0	0	0	0

The waste originated as decontamination sink and sample waste from the 222-B building (Harmon et al. 1975; Stenner et al. 1988).

According to Hanford drawing H-2-44501, Sheet 86, the site is monitored by vadose monitoring well 299-E28-51, but according to Appendix B of Law (1984) the soil column beneath the well is monitored by 299-E28-17 is used to survey the soil column beneath the 216-B-6 site.

8.3 216-B-10A AND 216-B-10B CRIBS

The 216-B-10A and 216-B-10B cribs are located about 160 ft south of the west end of the 222-B Building. The 216-B-10A crib was used December 1949 through January 1952, to receive decontamination sink and sample slurper waste from the 222-B building and floor drainage from the 292-B building (Stenner et al. 1988; BHI 1994). During this time the crib received 10,000,000 L of acidic liquid waste that contained TRU and fission products. Nitric acid and sodium dichromate were some of the inorganics also disposed at this site. Radionuclides contained in the waste stream include: cesium-137, ruthenium-106, strontium-90, and plutonium (Stenner et al. 1988; Brown et al. 1990).

The 216-B-10B crib received cascaded waste from the 216-B-10A crib when it was in service. Decontamination sink and shower waste from the 221-B building was sent directly to the 216-B-10B crib during the period June 1969 through October 1973. Similar inorganic and radionuclide wastes were disposed in both cribs, however, the volume in 216-B-10B was approximately 1/30th that of 216-B-10A (Stenner et al. 1988).

Vadose well 299-E28-17 monitors the soil column beneath the 216-B-10A and 216-B-10B cribs. The well is located 18.3 m southeast of the 216-B-10A crib and radiation levels are at or below background levels (Fecht et al. 1987).

Both sites were deactivated by disconnecting the pipeline to the units. The earth has subsided about 3 ft over the top of both of the units indicting deterioration of the structures (Hanford photographs A-24 and A-25) (Lundgren 1979; site visit by authors, September 1991).

8.4 216-B-13 FRENCH DRAIN

Twenty-eight thousand liters of 291-B-1 stack drainage was disposed to the 216-B-13 french drain located 300 ft south of the 221-B building and 25 ft north east of the 291-B-1 stack. The mixed liquid waste was low in salt and neutral/basic, and the site contains less than 0.004 g/m^3 potential plutonium. The site operated from August 1947 through June 1976. Prior to August 1947, the 291-B stack drainage was disposed in the 216-B-4 reverse well. In June 1976, the stack drainage was rerouted into a cell drainage sample tank. The BHI (1994) Hazardous Chemical Inventory lists only 2,000 kg of nitrate contained within the waste stream disposed by this unit (Stenner et al. 1988).

Hanford photograph A-26 depicts present surface conditions in the vicinity of the 216-B-13 french drain. The top of the structure is buried 8 ft below grade. It is marked by a yellow concrete post. A depression in the soil 8 ft from the marker could be due to the collapse of the plywood that covered the drain (site visit by authors, September 1991).

8.5 216-B-60 CRIB

The 216-B-60 crib consists of two steel vertical cascading caissons positioned side by side. They are located 4 ft west of the 221-B building approximately 2 ft below grade. In 1975, an extension to the 221-B building was added covering the crib. The cribs are currently under the northeast corner of the 225-B encapsulation facility (Maxfield 1979; Stenner et al. 1988).

The crib was specifically built for solid and liquid wastes generated from the clean-out of the 221-B building cell drain header that took place November 1967. The calculated total plutonium and fission product discharged to the site is 715.5 kg of uranium, 0.08 g of plutonium, 777 Ci of cerium-144, 8 Ci of cesium-137, and 5 Ci of europium-154 (BHI 1994).

After the drain header clean-out was completed, the caissons were plugged with 18 in. of concrete to seal the waste. The area was backfilled to grade and in 1975 the 225-B encapsulation facility was built over the site (Hanford photograph A-27) (Stenner et al. 1988).

8.6 218-E-6 BURIAL GROUND

In the fall of 1955, a shack and other wooden items were collected from the 291-B stack area, placed in a 4-ft-deep trench, burned, and the ashes covered. Later the site was exhumed and stabilized by seeding with Wintergraze, Crested, Siberian, and Thickspike wheatgrasses (Hanford photograph A-28). The site has since been released from radiation zone status (Stenner et al. 1988).

8.7 218-E-7 BURIAL GROUND

The 218-E-7 burial ground is located about 100 ft south of the 222-B building (Hanford photograph A-29). It consists of three underground vaults containing about 170 m^3 of mixed fission products and TRU solid mixed waste deposited from 1947 until 1952. Two of the vaults are 10 ft^2 by 12 ft deep constructed of 2-in. by 2-in. wooden planking. The top of each vault is 5 ft below grade and both have open bottoms. The third vault is an 8-ft-diameter concrete culvert pipe 25 ft, 2 in. deep. The pipe has a 9-in.-thick concrete cover and a 12-in.-thick concrete floor. Radionuclides contained within the waste include: cesium-137, ruthenium-106, strontium-90, plutonium, and uranium (Stenner et al. 1988; Anderson et al. 1991).

At the present time, the site is approximately 15 ft wide by 30 ft long and is delimited by a light-weight chain barricade with surface contamination and potential cave-in hazard warning signs. The southern edge of the site is adjacent to a small outdoor ICF Kaiser Hanford (ICF KH) engineers storage site. Nonnative grass and Russian thistle cover approximately 70% of the delimited surface.

8.8 241-BX-154 DIVERSION BOX AND 241-BX-302-B CATCH TANK

The 241-BX-154 diversion box is an inactive waste site located about 30 ft south of the 221-B building. The site was in service from 1948 until July 1984. The diversion box interconnects the 241-B-252 and 241-BX-155 diversions boxes and the 221-B building (Cramer 1987). Located adjacent to and below the diversion box is the 241-BX-302-B catch tank that collects waste spilled in the diversion box during transfers (Hanlon 1990). The site has been isolated and stabilized by application of a weather proofing plasticizer (Hanlon 1990; site visit by authors, September 1991).

8.9 241-BX-155 DIVERSION BOX, 241-BX-302-C CATCH TANK, AND UPR-200-E-78

This inactive waste site is located about 850 ft northeast of B Plant between Atlanta and Baltimore Avenues. The site was in service from 1948 until June 1984, transferring various types of waste solutions from processing and decontamination operations. The site interconnects the 241-BX-154 diversion box, 241-BX tank farm, and 221-B building (Cramer 1987; BHI 1994).

Located adjacent to and below the diversion box is the 241-BX-302-C catch tank that collects waste spilled in the diversion box during transfers (BHI 1994).

UPR-200-E-78 occurred when salt waste containing about 10 Ci of mixed fission products leaked from the diversion box during pressure testing of lines and jumpers contaminating about 200 ft^2 of the surrounding soil. The area was then covered with clean soil. The site has been isolated and stabilized by application of a weather proofing plasticizer (Hanlon 1990; site visit by authors, September 1991).

8.10 241-ER-152 DIVERSION BOX AND 241-ER-311 CATCH TANK

The diversion box 241-ER-152 active waste site is located approximately 180 ft southeast of the 224-B building. The site was activated in 1945 and transfers various types of waste solutions from processing and decontamination operations (Cramer 1987). Located adjacent to and at a lower elevation than the diversion box is the 241-ER-311 catch tank that collects waste spilled in the diversion box during transfers (Hanlon 1990).

8.11 2607-E3 SEPTIC TANK AND TILE FIELD

The 2607-E3 septic tank is an active waste site located about 400 ft north of the 221-B building. The site became operational in 1944 having a 292-person capacity and receives about 14.4 m^3 of sanitary wastewater and sewage per day from the B Plant facilities. The septic tank is 12 ft 6 in. deep and is constructed of reinforced concrete. The tile field is comprised of 4-in. VCP and drain tile with a minimum of 8 ft (linear) per person. The laterals are open jointed and are spaced 8 ft apart (Cramer 1987; Hanford drawing W-71192 R31). BHI (1994) indicate the septic tank and tile field contain no radionuclides or hazardous chemicals and in the nonhazardous/nonradioactive waste category (Cramer 1987). However, BHI (1994) General Summary Report (Tile Field South of 218-E-4) indicates that mixed waste may have been introduced to the tile field. Information in the general summary report is sketchy and incomplete. No markers indicating location of the site were seen in the field south of the 218-E-4 burial ground (site visit by authors, October 1991).

8.12 2607-E4 SEPTIC TANK AND TILE FIELD

This septic tank and sanitary tile field is an active site located 200 ft northeast of 224-B building. The site became operational in 1944 and currently receives about 0.24 m^3 of sanitary wastewater and sewage per day. BHI (1994) indicate the septic tank and tile field contain no radionuclides or hazardous chemicals and is in the nonhazardous/nonradioactive waste category. However, the septic tank and drain field are delimited with underground radiation warning signs (Cramer 1987; site visit by authors, September 1991).

8.13 270-E CONDENSATE NEUTRALIZATION TANK

West of the 221-B building is the 270-E condensate neutralization tank (270-E may be an incorrect number) authors could not determine tanks exact location or existence. BHI (1994) file UN-200-E-64 lists tank location as adjacent to the west side of the 216-B-64 retention basin. Access to this area was prohibited due to surface contamination). It was initially used in 1976 and is currently inactive. The tank may contain about 3,800 gal of sludge, which has a direct radiation level less than 100 c/m and a smearable level less than 0.5 mrem/h penetrating plus nonpenetrating radiation at the risers. The prioritization of this facility for decommissioning classifies the relative radiological hazard as high in comparison with other 200 Area surplus facilities (Cramer 1987).

8.14 TILE FIELD SOUTH OF 218-E-4

This site is discussed in association with the 218-E-4 burial ground, Section 12.1.

8.15 UN-200-E-1 UNPLANNED RELEASE

On October 14, 1966, soil contamination from a suspected waste line failure occurred near the 221-B building approximately 80 ft from a previous pipeline failure that occurred on June 17, 1946 (authors were unable to determine exact location). Test holes were driven to determine extent of contamination, then the area was fenced and posted. The contaminated area was covered with sufficient soil to reduce readings to 2 mrem/h. Vegetation above the waste lines was removed. Test shafts were drilled adjacent to waste lines where they pass under roadways to investigate potential leakage. Hydrostatic tests later confirmed the suspected waste line failure in each of the five transfer lines installed for project #C-112. Re-excavation of piping showed three major areas of electrolytic corrosion. The piping was removed and reinstalled in a v-shaped concrete trough and covered with concrete blocks then sealed for water tightness (Stenner et al. 1988).

8.16 UN-200-E-2 UNPLANNED RELEASE

On November 18, 1947, radioactive particulate matter up to 1/32-in. diameter were found within a 1,000-ft radius around the B Plant (291) stack. A study of the ground contamination found that mist-like particles were released over a larger area and that the particulate matter had magnetic properties. Later (circa February 1948) the inlet and outlet ducts of the exhaust fans were the source of contamination. Stainless steel fans and ductwork, cell ventilation ducts equipped with cooling water system filters, and scrubbers were fabricated and installed in dissolver off-gas lines to reduce the particulate releases. However, many studies and exhaust modifications were made over the following 2 yr to try and eliminate particulate emissions (Stenner et al. 1988; BHI 1994). High-efficiency particulate air filters were installed in about the mid-1960's to reduce radionuclide concentrations, however, radionuclide releases from the B stack continue but are reportedly within federal regulation limits (Health Physics, B Plant, personal communication; Saueressig, personal communication, 1991). The area around the stack and filtration systems is delimited with a light-weight chain barricade and surface contamination warning signs (site visit by authors, November 1991).

8.17 UN-200-E-3 UNPLANNED RELEASE

On November 21, 1951, a failure in the first-cycle waste line from the 221-B building to the 241-BX-154 diversion box contaminated the surrounding soil. Efforts to investigate the cause of the failure were abandoned when radiation levels of 120 R/h were encountered with 18 in. of soil remaining over the pipe (Stenner et al. 1988). In cases where high radiation levels are encountered during the investigation, the lateral extent of the contaminant plume would be approximated by the use of boreholes and the area posted with underground radioactive material warning signs. No attempt to repair the leak would be made (Health Physics, personal communication 1991).

8.18 UN-200-E-41 UNPLANNED RELEASE

This UPR occurred on July 19, 1972, when a leak in a waste line contaminated the R-13 stairwell of the 271-B building with an estimated 30 Ci of cesium-137. Readings of 12.5 R/h were recorded (Stenner et al. 1988). Cleanup actions were not reported in BHI (1994).

8.19 UN-200-E-44 UNPLANNED RELEASE

On August 16, 1972, a small cave in was discovered south of the R-17 change house next to 7th Street. No radioactive contamination was observed in or around the area of the cave in. An exploratory pit revealed a leak in the 6-in. BCS crib line. Soil surrounding the pipe was contaminated from 10,000 to 20,000 c/m with radiation levels of the pipe as high as 20 mrem/h. No spread of contamination from the excavation occurred (Radiation Occurrence Report 8-16-72; Stenner et al. 1988; BHI 1994). The R-17 change house was absent at time of site visit by authors and location of UN-200-E-44 could not be pinpointed.

8.20 UN-200-E-52 UNPLANNED RELEASE

A steam pressure relief valve set below the increased operating pressure of the E-52 strontium concentrator allowed steam to exit the system contaminating the soil beneath the relief valve, a portion of the north side of the 221-B building, and soil on the west side of the western berm adjacent to the eastern railroad spur (Health Physics personnel, B Plant, personal communication, 1991). The UPR was reported on August 1, 1975 (Radiation Occurrence Report 75-84). Radiation measurements ranged from 20,000 to 100,000 c/m. The outside of the building was cleaned to nonsmearable, painted, and marked with radiation warning signs. The contaminated soil was excavated, packaged, and sent to a burial ground. However, precipitation infiltrating into the railroad berm continues to release radionuclides trapped within the soil (Stenner et al. 1988; Health Physics personnel, B Plant, personal communication, 1991). No radiation signs or painted surfaces were observed (site visit by authors, November 1991).

8.21 UN-200-E-54 UNPLANNED RELEASE

On July 20, 1977, while decontaminating equipment inside the 225-B building, about 1/2-gal of contaminated wash water seeped under an unsealed doorway, onto a concrete pad, and soil outside the building. The concrete pad and about 1 ft^3 of soil were contaminated to radiation levels of 10,000 to 20,000 c/m. The pad and soil were removed and disposed to a burial ground (Radiation Occurrence Report 77-123). West of the 225-B building a wooden crate with radioactive materials warning signs is atop a new, small (4-ft by 8-ft) concrete pad with a rope barricade with radioactive materials warning signs. No evidence of the UPR was observed (site visit by authors, November 1991).

8.22 UN-200-E-55 UNPLANNED RELEASE

On April 27, 1979, a temporary radiation zone was established around the roadway south of the K-3 filter area and the gravel area southeast of the 212-B building after beta and gamma emitting contaminants of unknown origin were presumably wind blown from a nearby radiation zone. Surface measurements ranged from 5,000 to 30,000 c/m. The area was cleaned and released from monitoring (Radiation Occurrence Report and Unusual Occurrence Report #79-52, BHI 1994). No evidence of the UPR was seen during site visit (site visit by authors, November 1991).

8.23 UN-200-E-69 UNPLANNED RELEASE

On June 19, 1984, a concrete burial box (K-3 filter type) was removed from the 221-B railroad tunnel. When the burial car was pulled from the railroad tunnel small spots of beta and gamma contamination up to 20,000 c/m were detected about 3 ft from the west rail of the track. Flush water from underneath the burial box had spilled from the flat car while in transit to the burial facility (Radiation Occurrence Report #06-84-29). The railroad tunnel area has a 4-ft-high chain link fence along the side of the tracks. The area is posted with radiologically controlled area warning signs and is accessible from Atlantic Boulevard (site visit by authors, November 1991).

8.24 UN-200-E-80 UNPLANNED RELEASE

This UPR occurred on June 17, 1946, resulting from a leak in an underground waste line south of the 221-B building. An unknown amount of liquid waste created a slight depression that was later filled with radiologically clean gravel. The contaminated soil was removed and placed in the 200 East Dry Waste Burial Ground (McCullugh and Cartmell 1968; BHI 1994). At the present time, the area south of the eastern half of the 221-B canyon building a series of light-weight chain barricades with surface contamination warning signs encompasses a gravelly area posted with "surface stabilized area, no vehicles" warning signs (site visit by authors, November 1991).

8.25 UN-200-E-85 UNPLANNED RELEASE

During a routine survey high radiation levels were discovered in the R-13 utility pit adjacent to the 221-B canyon building. Radiation levels of 15 R/h existed in the northeast corner of the pit near the bottom. The 18-1 waste line was suspected to have leaked about 15 Ci of cesium-137 into the surrounding soil. No records or evidence of remediation were identified by the authors

(Maxfield 1979). The R-13 utility pit is covered with a steel lid. A light-weight chain barricade with surface contamination warning signs restrict access to the site (site visit by authors, November 1991).

8.26 UN-200-E-87 UNPLANNED RELEASE

This UPR occurred between 1945 and 1953 when alpha-laden moisture seeped through underground pipe joints on the south side of the 224-B building and contaminated the subsoil. A radiological survey in 1975 measured no detectable contamination above 200 c/m (Maxfield 1973; Lundgren 1970; Maxfield 1979; Morton 1980). Two light-weight chain barricaded areas with underground radioactive material warning signs are positioned adjacent to the south side of the 224-B building (site visit by authors, November 1991).

8.27 UN-200-E-90 UNPLANNED RELEASE

In September 1980 the area surrounding the 291-B stack sand filter (inoperable) and current filtration system was found to have high gamma dose rates. Millions of curies of radionuclides filtered through these systems and is the source of the radiation. The area adjacent to the filtration equipment is delimited with a light-weight chain barricade and surface contamination signs. No signs warning of "high-radiation" were seen (Maxfield 1981; Health Physics personnel, B Plant, 1991; site visit by authors, 1991).

8.28 UN-200-E-103 UNPLANNED RELEASE

This UPR occurred on March 8, 1972, when a leak in the BCS crib line south of the R-17 change house contaminated the surrounding soil. A surface radiological survey recorded readings of beta and gamma contamination up to 1,500 c/m. The leak was sealed and the area barricaded as a radiation zone (Stenner et al. 1988). The area of the UPR could not be pinpointed during site visit by authors. The area adjacent to the R-17 stairwell of the 221-B building is now being used as an aboveground storage area for drums. This area is delimited with a light-weight chain barricade with radioactive material warning signs (site visit by authors, November 1991).

8.29 UN-200-E-140 UNPLANNED RELEASE

On April 23, 1986, about 7.6 L of PCB contaminated oil spilled on the ground at the 221-B bulk storage area. The soil was removed and drummed for disposal as PCB contaminated waste (Cramer 1987). Authors could not determine precise location of spill. No warning signs or evidence of the UPR were observed (site visit by authors, November 1991).

8.30 224-B CONCENTRATION FACILITY

This unit is a concrete and concrete block building 197 ft long, 60 ft wide, and 70 ft high containing radioactive equipment and concrete. Hazardous constituents include mercury, PCB, residual leaning chemicals, and radionuclides consisting of about 35 Ci of plutonium, 5.2 Ci of americium-241, 2.1 Ci of strontium-90, 3.6 Ci of cobalt-60, and 1 Ci of cesium-137 (Cramer 1987). The 224-B building has radiologically controlled area and radioactive material warning signs on every door. A light-rope barricade surrounds a wooden crate with radioactive warning signs stored atop a small concrete storage pad on the west side of the building (site visit by authors, November 1991).

8.31 226-B HAZARDOUS WASTE STORAGE AREA

The 226-B hazardous waste storage area (HWSA) is located north of the 221-B building and is an active site for temporary storage of hazardous materials. Typical wastes contained in the storage area over the past year include about 184 kg of halogenated hydrocarbons, 2,200 kg of sodium hydroxide and alkaline liquids, 800 kg of antifreeze, 1.84 kg of acids, 580 kg of miscellaneous toxic process chemicals, 1,155 kg of methyl ethyl ketone and flammable solvents (Cramer 1987). The 226-B HWSA consists of a concrete pad surrounded by a light chain barricade. The site is labeled "226-B hazardous waste 90 day staging area" and "PCB 30 day storage." No radioactive material warning signs were seen around the site (site visit by authors, November 1991).

8.32 291-B STACK AND FILTER

In response to contaminated airborne particulate releases from the 291-B (B Plant) stack, a sand bed filter system was installed to reduce the radionuclide concentration in the air stream. The filter is now inoperable and has been replaced by newer filtration systems. During its operational history the unit has accumulated millions of curies of radionuclide activity, with gamma emission levels recorded at 100+ mrem/h at the western boundary of the sand filter unit (Health Physics, B Plant, personal communication 1991; Environmental Protection, personal communication 1991). The area surrounding the stack and filtration equipment is delimited with a light-weight chain barricade with surface contamination placards (site visit by authors, 1991). This area is not listed in the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1991).

8.33 UNKNOWN SITE

An unnumbered site approximately 10 ft north of the 216-B-10A crib was recorded during the operable unit site visit. It consists of two stainless steel pipes placed vertically located within a 10 ft by 10 ft^2 area delimited with a light-weight chain barricade and surface contamination signs. The pipe is about 14 in. in diameter, has a lid bolted on top, and stands about 3.5 ft above grade. What appears to be a small 1-in.-diameter inlet line is seen rising from the ground surface to the top of the stainless steel cover bolted on top. The second pipe is about 8 in. in diameter extending approximately 3.5 ft above grade and is situated about 1 ft away from the larger pipe. This pipe also has a stainless steel lid bolted to the top. Authors discussed the site with Environmental Protection and B Plant Health Physics personnel, but the number and purpose of the unit could not be determined. This unit is not in Ecology et al. (1991).

8.34 ICF KAISER HANFORD HOT STORAGE YARD

Approximately 60 ft south of the 216-B-10A and 216-B-10B cribs is an outdoor storage facility containing contaminated materials and equipment. The area is about 30 ft wide by 100 ft long and is secured by an 8-ft-high chain link fence with surface contamination warning signs. It is believed that contaminants from the equipment and materials migrated to the ground surface prompting the surface contamination signs. The inside perimeter of the fence is heavily vegetated with tumble weeds. This site is not included in Ecology et al. (1991) (site visit by authors, 1991).

9.0 OPERABLE UNIT 200-BP-7

Operable Unit 200-BP-7 is located in the north central portion of the 200 East Area (Figure 1-1). The 241-B, 241-BX, and 241-BY tank farms associated with B Plant constitute this operable unit (Figure 3-1). Thus, the fact that the entire surface area of this operable unit is contaminated is not unexpected (Figure 2-2). A list of the sites within this operable unit, their operational status, and the type of waste disposed at each site is given in Table 9-1. Note that septic tank 2607-EB is the only operational site within this operable unit. The operational history of each tank and associated sites is depicted graphically in Figure 9-1, and listed in Table 9-2.

Spatial relationships and transfer configurations between the various 200 Area tank farms and diversion boxes are extremely complex. The entire tank farm system is designed to allow movement of waste between tank farms. Figure 9-2 depicts the general tank farm waste distribution system for the 200 East and West Areas. A more detailed figure showing the current waste transfer configuration of the 200 East Area is shown in Figure 9-3. It is clear that the configuration of tanks, valve pits, and diversion boxes permit the transfer of waste from any processing plant to any tank, or between any two tanks, located anywhere within the 200 East or West Areas.

Three inactive tank farms, the 241-B, 241-BX, and 241-BY, and their associated facilities, such as diversion boxes, valve pits, and catch tanks were evaluated in this study. All three tank farms contain single-shell tanks (Table 9-1). Tank farms were not evaluated to determine their potential migration hazard; therefore, the sites in this operable unit have a PNL hazard rank of zero (Table 9-2; Stenner et al. 1988).

Table 9-3 provides a summary of current site conditions based on several site visits performed by the authors during the September through November 1991 time period. Note, the lack of a defined surface contamination or radiation zone for each site indicates that the sites are enclosed within the larger contamination zone barricaded by the chain link fence encircling the tank farms.

There were organic or inorganic contaminants listed in BHI (1994) for any site in this operable unit. However, Appendix D provides a listing of the radionuclides, selected elements, and selected organic and inorganic compounds for each tank of the operable unit listed in Ecology et al. (1991). This radionuclide and chemical database was created by a computer simulation model, named TRAC, which was constructed to track the radionuclides in the 200 Area tank farms. To accomplish this, the entire tank farm system, for both the 200 East and 200 West Areas, was modeled. In November 1991 the model underwent a DOE quality assurance spot audit. Currently, model predictions are being calibrated against field samples. The radionuclides listed by the TRAC model have been decayed through 1985 (Simpson, personal communication 1991). The authors have not validated the data contained in this appendix.

Table 9-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-7.
(sheet 1 of 2)

Site	Type of Site	Status	Coordinates	Type of Waste
241-B-101	Single-Shell Tank	Inactive	N45237 W52552	Mixed Waste
241-B-102	Single-Shell Tank	Inactive	N45337 W52552	Mixed Waste
241-B-103	Single-Shell Tank	Inactive	N45437 W52552	Mixed Waste
241-B-104	Single-Shell Tank	Inactive	N45437 W52652	Mixed Waste
241-B-105	Single-Shell Tank	Inactive	N45337 W52652	Mixed Waste
241-B-106	Single-Shell Tank	Inactive	N45437 W52652	Mixed Waste
241-B-107	Single-Shell Tank	Inactive	N45237 W52752	Mixed Waste
241-B-108	Single-Shell Tank	Inactive	N45337 W52752	Mixed Waste
241-B-109	Single-Shell Tank	Inactive	N45437 W52752	Mixed Waste
241-B-110	Single-Shell Tank	Inactive	N45237 W52852	Mixed Waste
241-B-111	Single-Shell Tank	Inactive	N45337 W52852	Mixed Waste
241-B-112	Single-Shell Tank	Inactive	N45437 W52852	Mixed Waste
241-B-151	Diversion box	Inactive	N44967 W52913	Mixed Waste
241-B-152	Diversion Box	Inactive	N44994 W52956	Mixed Waste
241-B-153	Diversion Box	Inactive	N45113 W52884	Mixed Waste
241-B-201	Single-Shell Tank	Inactive	N45537 W52727	Mixed Waste
241-B-202	Single-Shell Tank	Inactive	N45537 W52777	Mixed Waste
241-B-203	Single-Shell Tank	Inactive	N45537 W52827	Mixed Waste
241-B-204	Single-Shell Tank	Inactive	N45537 W52877	Mixed Waste
241-B-252	Diversion box	Inactive	N45500 W52976	Mixed Waste
241-B-301B	Catch Tank	Inactive	N45470 W52978	Mixed Waste
241-BR-152	Diversion Box	Inactive	N45200 W53200	Mixed Waste
241-BX-101	Single-Shell Tank	Inactive	N45400 W53250	Mixed Waste
241-BX-102	Single-Shell Tank	Inactive	N45500 W53250	Mixed Waste
241-BX-103	Single-Shell Tank	Inactive	N45600 W53250	Mixed Waste
241-BX-104	Single-Shell Tank	Inactive	N45400 W53350	Mixed Waste
241-BX-105	Single-Shell Tank	Inactive	N45500 W53350	Mixed Waste
241-BX-106	Single-Shell Tank	Inactive	N45600 W53350	Mixed Waste
241-BX-107	Single-Shell Tank	Inactive	N45400 W53450	Mixed Waste
241-BX-108	Single-Shell Tank	Inactive	N45500 W53450	Mixed Waste
241-BX-109	Single-Shell Tank	Inactive	N45600 W53450	Mixed Waste
241-BX-110	Single-Shell Tank	Inactive	N45400 W53550	Mixed Waste
241-BX-111	Single-Shell Tank	Inactive	N45500 W53550	Mixed Waste
241-BX-112	Single-Shell Tank	Inactive	N45600 W53550	Mixed Waste
241-BX-153	Diversion box	Inactive	N45300 W53320	Mixed Waste
241-BX-302A	Catch Tank	Inactive	N45290 W53205	Mixed Waste
241-BXR-151	Diversion Box	Inactive	N45200 W53430	Mixed Waste
241-BXR-152	Diversion Box	Inactive	N45200 W53235	Mixed Waste
241-BXR-153	Diversion box	Inactive	N45200 W53330	Mixed Waste
241-BY-101	Single-Shell Tank	Inactive	N45898 W53247	Mixed Waste

Table 9-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-7. (sheet 2 of 2)

241-BY-102	Single-Shell Tank	Inactive	N46000 W53247	Mixed Waste
241-BY-103	Single-Shell Tank	Inactive	N46102 W53247	Mixed Waste
241-BY-104	Single-Shell Tank	Inactive	N45898 W53349	Mixed Waste
241-BY-105	Single-Shell Tank	Inactive	N46000 W53349	Mixed Waste
241-BY-106	Single-Shell Tank	Inactive	N46102 W53349	Mixed Waste
241-BY-107	Single-Shell Tank	Inactive	N45898 W53451	Mixed Waste
241-BY-108	Single-Shell Tank	Inactive	N46000 W53451	Mixed Waste
241-BY-109	Single-Shell Tank	Inactive	N46102 W53451	Mixed Waste
241-BY-110	Single-Shell Tank	Inactive	N45898 W53553	Mixed Waste
241-BY-111	Single-Shell Tank	Inactive	N46000 W53553	Mixed Waste
241-BY-112	Single-Shell Tank	Inactive	N46102 W53553	Mixed Waste
241-BYR-152	Diversion Box	Inactive	N45200 W53275	Mixed Waste
241-BYR-153	Diversion Box	Inactive	N45200 W53380	Mixed Waste
241-BYR-154	Diversion Box	Inactive	N45200 W53260	Mixed Waste
242-B-151	Diversion Box	Inactive	N45152 W52720	Mixed Waste
244-BXR VAULT	Receiving Vault	Inactive	N45260 W53500	Mixed Waste
2607-EB	Septic Tank	Active	N46100 W53675	Nonhazardous/Nonradioactive
UN-200-E-101	Unplanned Release	Inactive	N45100 W52600	Mixed Waste
UN-200-E-105	Unplanned Release	Inactive	N45875 W53425	Mixed Waste
UN-200-E-109	Unplanned Release	Inactive	N45375 W52725	Mixed Waste
UN-200-E-43	Unplanned Release	Inactive	N46050 W53725	Mixed Waste
UN-200-E-76	Unplanned Release	Inactive	N45100 W52900	Mixed Waste
UN-200-E-79	Unplanned Release	Inactive	N44950 W52600	Mixed Waste
UPR-200-E-108	Unplanned Release	Inactive	N45200 W52925	Mixed Waste
UPR-200-E-116	Unplanned Release	Inactive	N46000 W53450	Mixed Waste
UPR-200-E-127	Unplanned Release	Inactive	N45238 W52753	Mixed Waste
UPR-200-E-128	Unplanned Release	Inactive	N45238 W52853	Mixed Waste
UPR-200-E-129	Unplanned Release	Inactive	N45550 W52850	Mixed Waste
UPR-200-E-130	Unplanned Release	Inactive	N45537 W52828	Mixed Waste
UPR-200-E-131	Unplanned Release	Inactive	N45500 W53250	Mixed Waste
UPR-200-E-132	Unplanned Release	Inactive	N45500 W53225	Mixed Waste
UPR-200-E-133	Unplanned Release	Inactive	N45500 W53450	Mixed Waste
UPR-200-E-134	Unplanned Release	Inactive	N46102 W53247	Mixed Waste
UPR-200-E-135	Unplanned Release	Inactive	N46000 W53451	Mixed Waste
UPR-200-E-38	Unplanned Release	Inactive	N45000 W53000	Mixed Waste
UPR-200-E-4	Unplanned Release	Inactive	N44000 W52950	Mixed Waste
UPR-200-E-5	Unplanned Release	Inactive	N45500 W53400	Mixed Waste
UPR-200-E-6	Unplanned Release	Inactive	N45100 W52900	Mixed Waste
UPR-200-E-73	Unplanned Release	Inactive	N44960 W52950	Mixed Waste
UPR-200-E-74	Unplanned Release	Inactive	N45000 W53000	Mixed Waste
UPR-200-E-75	Unplanned Release	Inactive	N45100 W52900	Mixed Waste

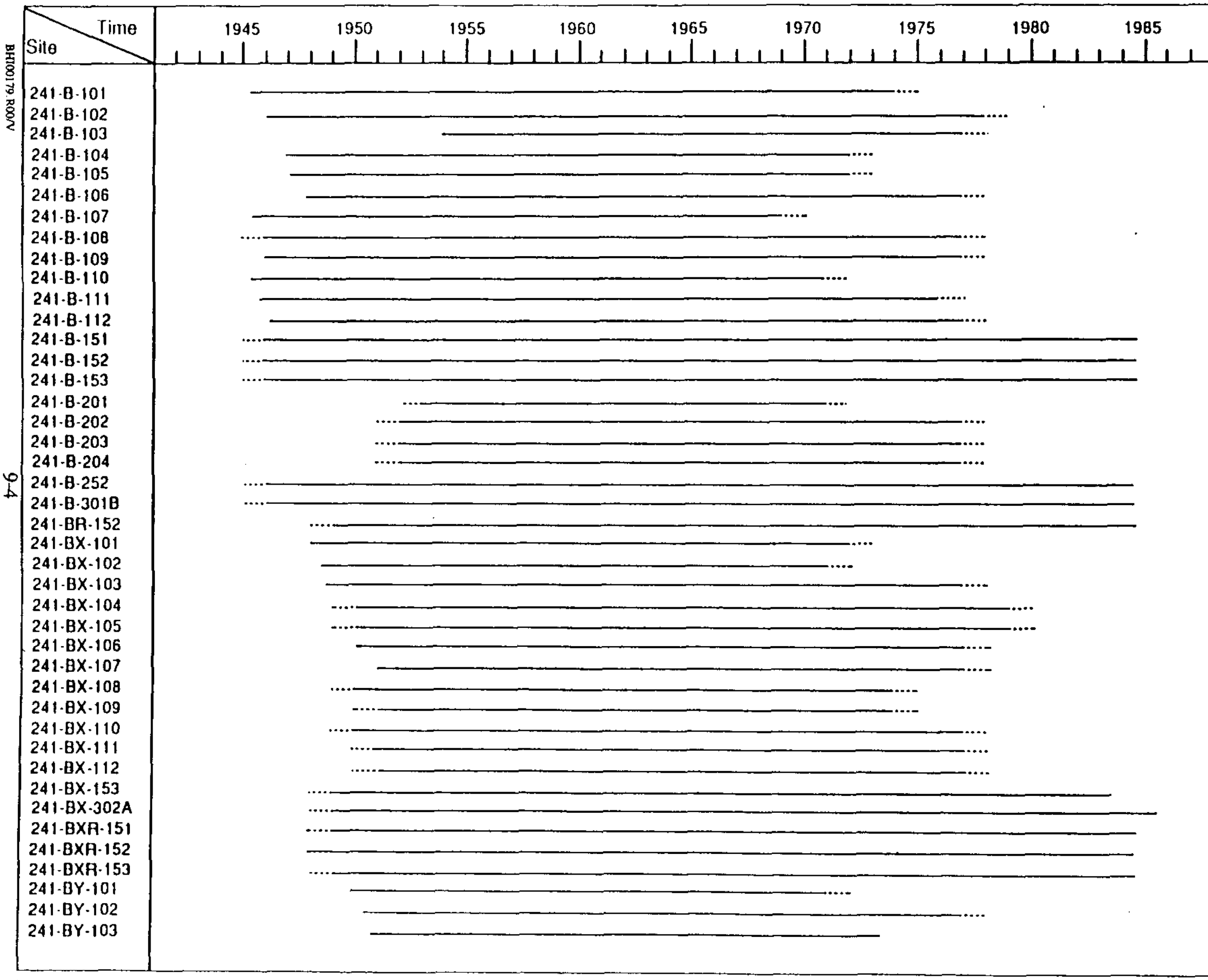


Figure 9-1. Summary of Operational Periods for Operable Unit 200-BP-7.
(sheet 1 of 2)

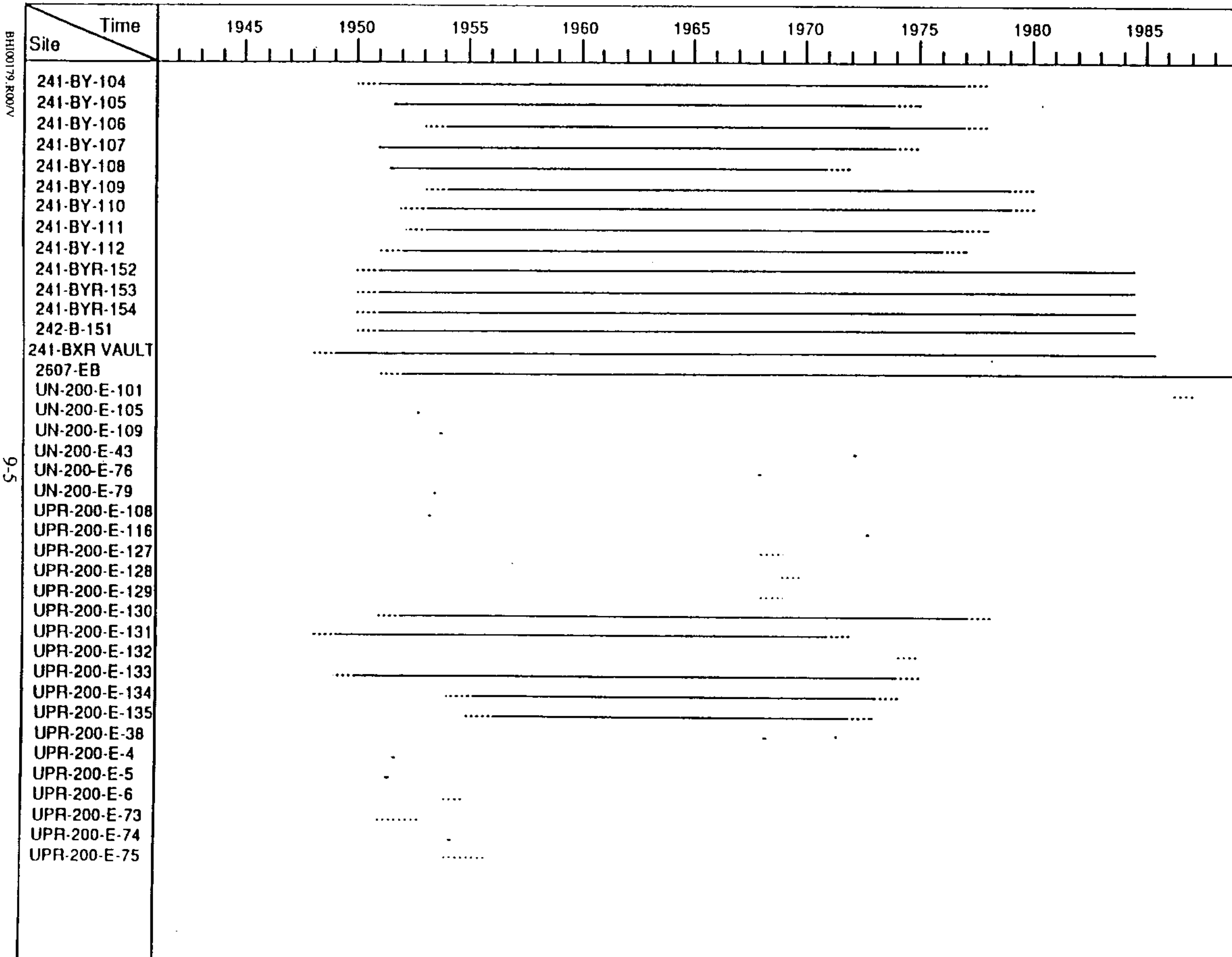


Figure 9-1. Summary of Operational Periods for Operable Unit 200-BP-7. (sheet 2 of 2)

Table 9-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-7.
(sheet 1 of 2)

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR t)	PNL Hazard Ranking	Associated UPR(s)
241-B-101	Liquid	May 1945	1974		Top	0	0	0	0	0	0.00	UPR-200-E-108
241-B-102	Liquid	October 1945	1978		Top	0	0	0	0	0	0.00	
241-B-103	Liquid	December 1953	1977		Top	0	0	0	0	0	0.00	
241-B-104	Liquid	August 1946	1972		Top	0	0	0	0	0	0.00	
241-B-105	Liquid	January 1947	1972		Top	0	0	0	0	0	0.00	
241-B-106	Liquid	September 1947	1977		Top	0	0	0	0	0	0.00	
241-B-107	Liquid	May 1945	1969		Top	0	0	0	0	0	0.00	UPR-200-E-127
241-B-108	Liquid	1945	1977		Top	0	0	0	0	0	0.00	
241-B-109	Liquid	January 1946	1977		Top	0	0	0	0	0	0.00	
241-B-110	Liquid	May 1945	1971		Top	0	0	0	0	0	0.00	UPR-200-E-128
241-B-111	Liquid	November 1945	1976		Top	0	0	0	0	0	0.00	
241-B-112	Liquid	April 1946	1977		Top	0	0	0	0	0	0.00	
241-B-151	Liquid	1945	June 1984		Top	20	9	0	0	0	0.00	UPR-200-E-4,-73
241-B-152	Liquid	1945	June 1984		Top	26	9	0	0	0	0.00	UPR-200-E-38,-74
241-B-153	Liquid	1945	June 1984		Top	34	9	0	0	0	0.00	UPR-200-E-6,-75
241-B-201	Liquid	1952	1971		Top	0	0	0	0	0	0.00	UPR-200-E-129
241-B-202	Liquid	1951	1977		Top	0	0	0	0	0	0.00	
241-B-203	Liquid	1951	1977		Top	0	0	0	0	0	0.00	UPR-200-E-130
241-B-204	Liquid	1951	1977		Top	0	0	0	0	0	0.00	
241-B-252	Liquid	1945	June 1984		Top	36	9	0	0	0	0.00	
241-B-301B	Liquid	1945	June 1984		Top	0	0	0	0	0	0.00	
241-BR-152	Liquid	1948	June 1984		Top	0	0	0	0	0	0.00	
241-BX-101	Liquid	January 17, 1948	1972		Top	0	0	0	0	0	0.00	
241-BX-102	Liquid	June 10, 1948	1971		Top	0	0	0	0	0	0.00	UPR-200-E-5,131,132
241-BX-103	Liquid	September 30, 1948	1977		Top	0	0	0	0	0	0.00	UPR-200-E-134
241-BX-104	Liquid	1949	1980		Top	0	0	0	0	0	0.00	
241-BX-105	Liquid	1949	1980		Top	0	0	0	0	0	0.00	
241-BX-106	Liquid	1949	1977		Top	0	0	0	0	0	0.00	
241-BX-107	Liquid	September 1948	1977		Top	0	0	0	0	0	0.00	
241-BX-108	Liquid	1949	1974		Top	0	0	0	0	0	0.00	UPR-200-E-133
241-BX-109	Liquid	1950	1974		Top	0	0	0	0	0	0.00	
241-BX-110	Liquid	1949	1977		Top	0	0	0	0	0	0.00	
241-BX-111	Liquid	1950	1977		Top	0	0	0	0	0	0.00	
241-BX-112	Liquid	1950	1977		Top	8	0	0	0	0	0.00	
241-BX-153	Liquid	1948	June 1983		Top	40	9	0	0	0	0.00	
241-BX-302A	Liquid	1948	July 1985		Top	0	0	0	0	0	0.00	
241-BXR-151	Liquid	1948	June 1984		Top	0	0	0	0	0	0.00	

Table 9-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-7. (sheet 2 of 2)

241-BXR-152	Liquid	1948	June 1984		Top	0	0	0	0	0	0.00	
241-BXR-153	Liquid	1948	June 1984		Top	0	0	0	0	0	0.00	
241-BY-101	Liquid	January 1950	1971		Top	0	0	0	0	0	0.00	
241-BY-102	Liquid	July 1950	1977		Top	0	0	0	0	0	0.00	
241-BY-103	Liquid	November 1950	May 1973		Top	0	0	0	0	0	0.00	
241-BY-104	Liquid	1950	1977		Top	0	0	0	0	0	0.00	
241-BY-105	Liquid	June 1951	1974		Top	0	0	0	0	0	0.00	
241-BY-106	Liquid	1953	1977		Top	0	0	0	0	0	0.00	
241-BY-107	Liquid	December 1950	1974		Top	0	0	0	0	0	0.00	
241-BY-108	Liquid	April 1951	1972		Top	0	0	0	0	0	0.00	UPR-200-E-135
241-BY-109	Liquid	1953	1979		Top	0	0	0	0	0	0.00	
241-BY-110	Liquid	1952	1979		Top	0	0	0	0	0	0.00	
241-BY-111	Liquid	1952	1977		Top	0	0	0	0	0	0.00	
241-BY-112	Liquid	1951	1976		Top	0	0	0	0	0	0.00	UPR-200-E-116
241-BYR-152	Liquid	1950	June 1984		Top	0	0	0	0	0	0.00	
241-BYR-153	Liquid	1950	June 1984		Top	0	0	0	0	0	0.00	
241-BYR-154	Liquid	1950	June 1984		Top	0	0	0	0	0	0.00	
242-B-151	Liquid	1945	June 1984		Top	0	0	0	0	0	0.00	
244-BXR VAULT	Liquid	1948	July 1985		Top	0	0	0	0	0	0.00	
2607-EB	Liquid	1951	Active		Top	0	0	0	0	0	0.00	
UN-200-E-101	Liquid			1986	Top	0	0	0	0	0	0.00	
UN-200-E-105	Liquid			December 15, 1952	Top	0	0	0	0	87064	1.14	
UN-200-E-109	Liquid			November 11, 1953	Top	0	0	0	0	0	1.04	
UN-200-E-43	Liquid			January 10, 1972	Top	0	0	0	0	0	1.04	
UN-200-E-76	Liquid			January 4, 1968	Top	0	0	0	0	20441	0.98	
UN-200-E-79	Liquid			June 1953	Top	100	50	1	0	0	1.20	
UPR-200-E-108	Liquid			April 14, 1953	Top	0	0	0	0	0	1.14	
UPR-200-E-116	Liquid			November 20, 1972	Top	0	0	0	0	0	0.00	
UPR-200-E-127	Liquid			1968	Top	0	0	0	0	0	0.00	
UPR-200-E-128	Liquid			1969	Top	0	0	0	0	0	0.00	
UPR-200-E-129	Liquid			1968	Top	0	0	0	0	0	0.00	
UPR-200-E-130	Liquid			1951 through 1977	Top	0	0	0	0	0	0.00	
UPR-200-E-131	Liquid			1948-1971	Top	0	0	120	0	0	0.00	
UPR-200-E-132	Liquid			1974	Top	0	0	0	0	0	0.00	
UPR-200-E-133	Liquid			1949-1974	Top	0	0	0	0	0	0.00	
UPR-200-E-134	Liquid			1954-1973	Top	0	0	0	0	0	0.00	
UPR-200-E-135	Liquid			1955-1972	Top	0	0	0	0	0	0.00	
UPR-200-E-38	Liquid			January 4, 1968	Top	0	0	0	0	0	0.00	
UPR-200-E-4	Liquid			Fall 1951	Top	0	0	0	0	0	1.14	
UPR-200-E-5	Liquid			March 20, 1951	Top	0	0	0	0	0	1.20	
UPR-200-E-6	Liquid			1954	Top	0	0	0	0	0	1.09	
UPR-200-E-73	Liquid			1951-1952	Top	0	0	0	0	0	1.04	
UPR-200-E-74	Liquid			Spring 1954	Top	0	0	0	0	0	1.04	
UPR-200-E-75	Liquid			1954-1955	Top	100	50	0	0	0	1.09	

Figure 9-2. Schematic Diagram Depicting the 200 Areas Tank Farm Distribution System.

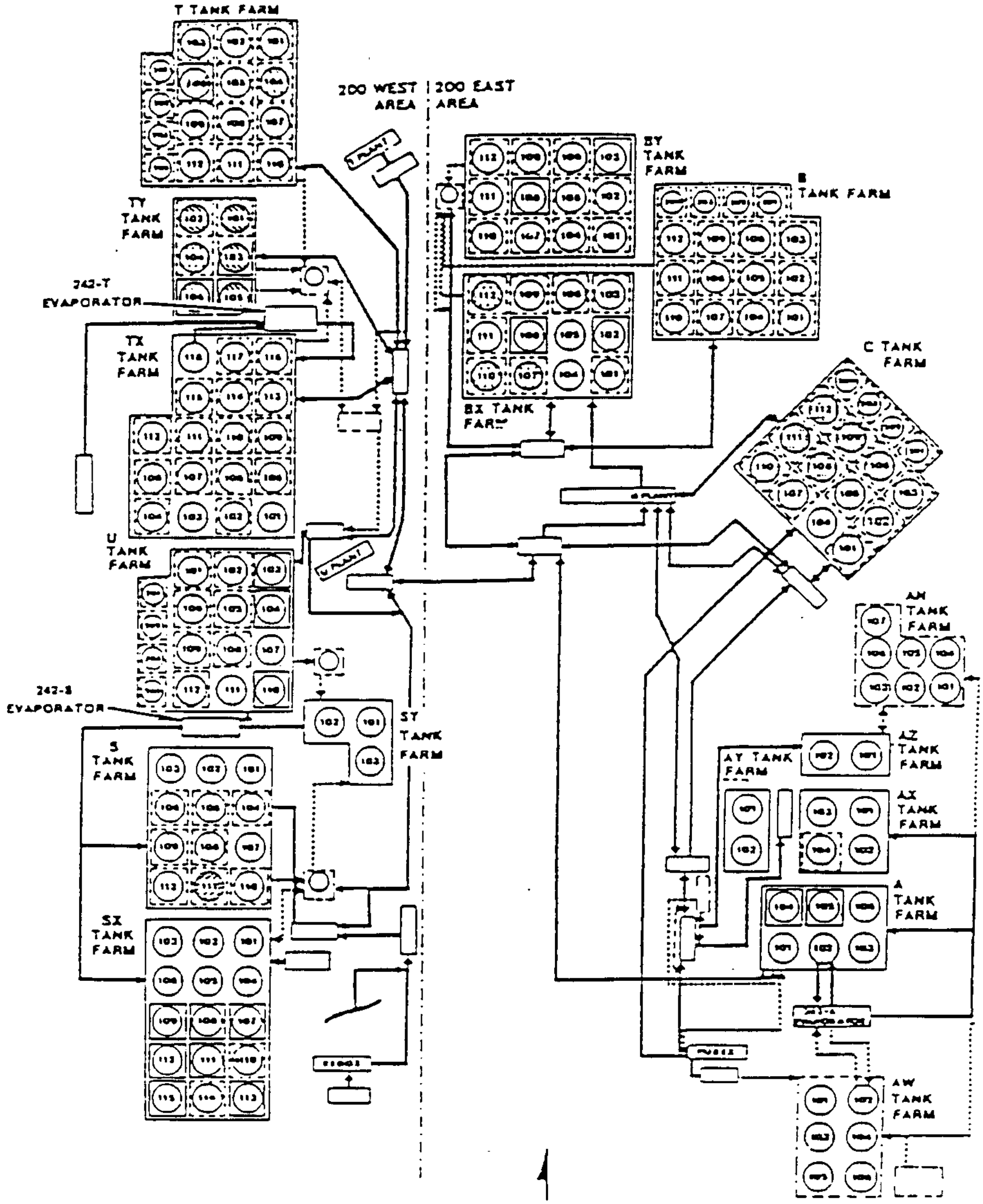


Table 9-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-7. (sheet 1 of 2)

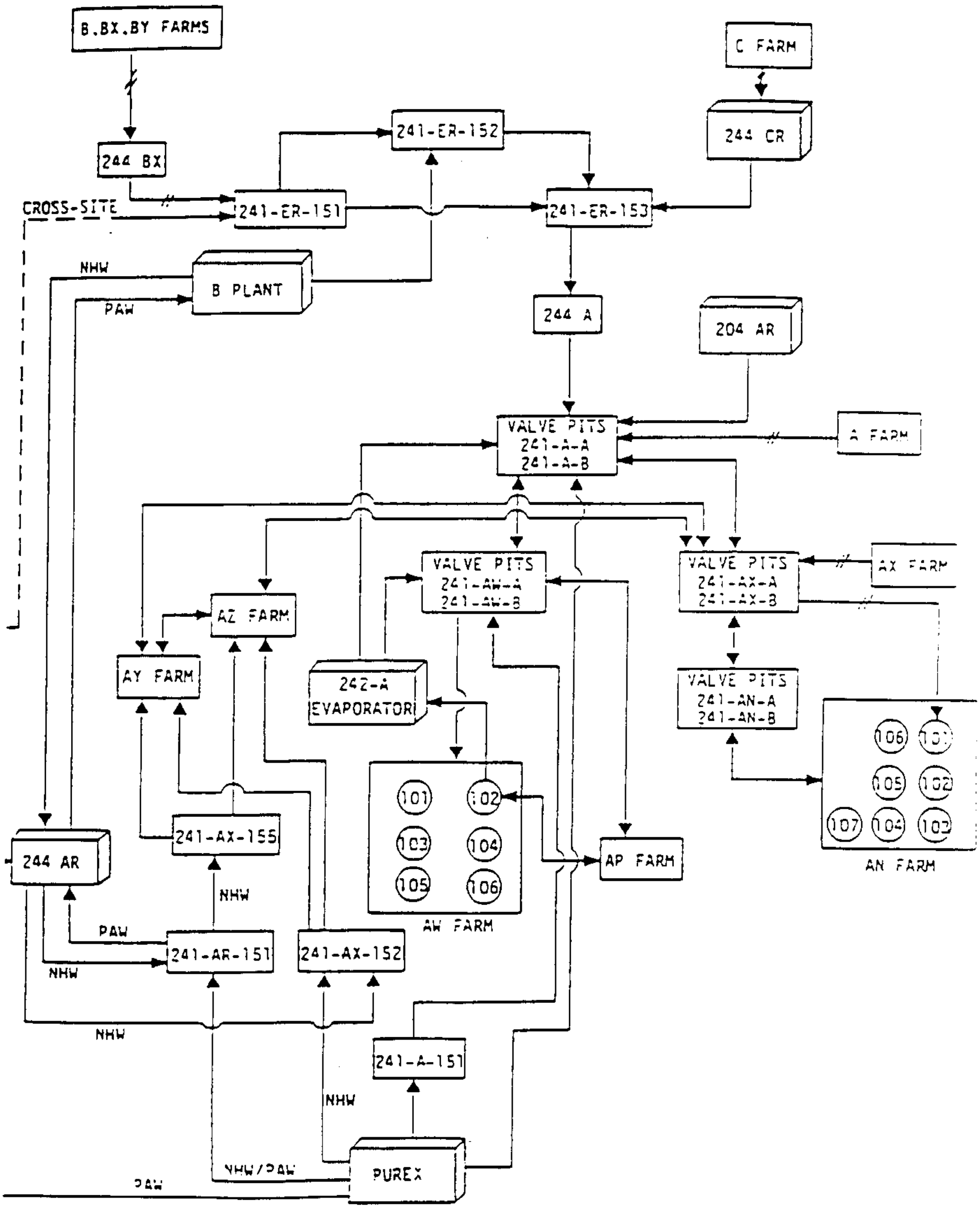
Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad. Zone (sq ft)
241-BX-302A	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BXR-151	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0
241-BXR-152	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0
241-BXR-153	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0
241-BY-101	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-102	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-103	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-104	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-105	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-106	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-107	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-108	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-109	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-110	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-111	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BY-112	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BYR-152	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BYR-153	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BYR-154	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
242-B-151	Chain Link Fence	Surface Contamination	None	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0
244-BXR Vault	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
2607-EB	Light Chain	None	Metal Post with Plaque	None/Unknown	2.0	None	None	0	0
UN-200-E-101	Light Chain	Underground Contamination	None	Gravel/Soil Cover	0.0	None	None	0	0
UN-200-E-105	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
UN-200-E-109	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
UN-200-E-43	None	None	None	None/Unknown	0.0	None	could not locate	20000	20000
UN-200-E-76	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	0.0	None	Inside Tank Farm	0	0
UN-200-E-79	None	None	None	None/Unknown	0.0	Brush/Grass	could not locate	0	0

Table 9-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-7. (sheet 2 of 2)

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con (sq ft)	Rad Zone (sq ft)
241-B-101	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-102	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-103	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-104	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-105	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-106	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-107	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-106	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-109	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-110	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-111	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-112	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-151	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	2.0	None	Inside Tank Farm	0	0
241-B-152	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	2.0	None	Inside Tank Farm	0	0
241-B-153	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0
241-B-201	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-202	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-203	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-204	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-B-252	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0
241-B-301B	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	0.0	None	Inside Tank Farm	0	0
241-BR-152	Chain Link Fence	Surface Contamination	None	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0
241-BX-101	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-102	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-103	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-104	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-105	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-106	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-107	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-106	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-109	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-110	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-111	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-112	Chain Link Fence	Surface Contamination	Could not determine	None/Unknown	2.0	None	Inside Tank Farm	0	0
241-BX-153	Chain Link Fence	Surface Contamination	Could not determine	Sprayed Plastic Foam	3.0	None	Inside Tank Farm	0	0

Figure 9-3. Schematic Diagram of the Waste Transfer Configuration for the 200 East Area.



9.1 241-B TANK FARM TANKS 241-B-101 THROUGH 241-B-112, 241-B-201 THROUGH 241-B-204, UPR-200-E-108, AND UPR-200-E-127 THROUGH UPR-200-E-130

The 241-B tank farm consists of a series of buried single-shell, carbon-steel-lined, concrete-reinforced tanks containing mixed waste (Figure 9-4). It is located about 2,600 ft north northeast of the 221-B building. The surface elevation is about 653 ft above mean sea level (amsl), and depth to groundwater is approximately 249 ft below ground surface (Stalos and Walker 1977; WHC 1988).

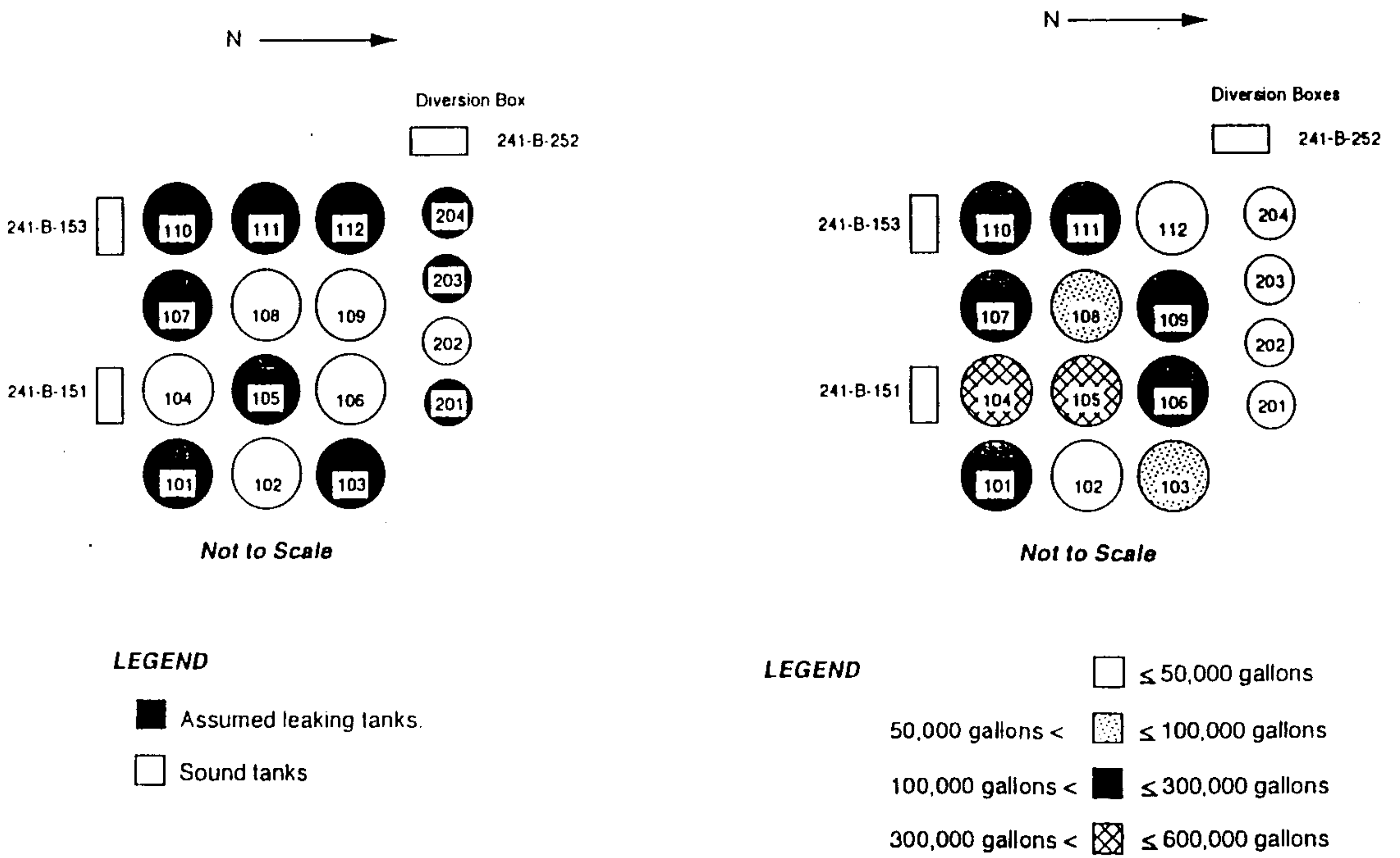
There are 16 tanks in the tank farm. Twelve of the tanks have individual capacities of 533,000 gal and are numbered 241-B-101 through 241-B-112. Four smaller capacity tanks (55,000 gal) numbered 241-B-201 through 241-B-204 comprise the tank farm. The tanks are inactive and have undergone initial stabilization interim isolation. The operational history, design, and location of the tanks are similar and will therefore be treated as a single site. Brief descriptions of each tank will follow this section, giving specific details on each tank, as well as associated sites such as diversion boxes, catch tanks, and UPRs (Stalos and Walker 1977; Hanlon 1991a). Table 9-4 summarizes some of the pertinent characteristics of the 241-B tank farm.

The 241-B tank farm was constructed to receive nonboiling wastes from the 221-B building. The tanks are arranged in groups of three using the settling cascade concept, in which waste solution is cascaded through a three-tank series. Cooling and precipitation occurred in each tank causing the bulk of the radionuclides to collect in the tank bottoms. To prevent radiogenic heating of the waste, air-cooled reflux condensers were installed to return the condensate to the tank and vent the noncondensable gases to the atmosphere.

There were four major waste streams generated by the bismuth phosphate plutonium recovery process, conducted in the 221-B building until 1956, which were sent to the B tank farm. One waste stream consisted of metal waste with all of the uranium and 90% of the original fission products generated by the bismuth phosphate process. Another waste stream consisted of coating waste from dissolution of aluminum cladding of fuel rods and contained small amounts of fission products. A third consisted of first-cycle decontamination waste containing less than 0.1% of the fission product activity and 1% of the plutonium. The fourth, second-cycle decontamination waste containing less than 0.1% of the fission activity and 1% of the plutonium. Other less voluminous waste sources were the Waste Solidification Program and the Waste Fractionation Program (Stalos and Walker 1977; BHI 1994).

The four smaller tanks received lanthanum fluoride from the 224-U building (200 West Area). Tank 241-B-202 also received high-level B Plant waste. These tanks were operated independently of the large in-line cascade series tanks discussed previously (Jungfeisch 1983).

Eight tanks were removed from service due to questionable integrity. They are 241-B-101, 241-B-103, 241-B-105, 241-B-107, 241-B-110, 241-B-111, 241-B-112, and 241-B-201. A P-10 salt well system was installed in each of these tanks (except 241-B-103, 241-B-111, and 241-B-112) to reduce residual fluids and transfer the waste to tank 102-B, currently classified as inactive-sound.



A. Schematic diagram depicting individual tank integrity.

B. Schematic diagram depicting the quantity of total waste by individual tank in the B Tank Farm.

Figure 9-4. The 241-B Tank Farm Tank Integrity and Waste Volumes.

Table 9-4. Summary of 241-B Tank Farm Waste Volumes and Waste Streams.

Tank	Status	Supernatant Liquid (gal)	Sludge (gal)	Saltcake (gal)	Total Waste (gal)	Waste Stream	Supernatant Waste Stream
101	assumed leak	0	113,000	0	113,000	1,11,16	S8, S23
102	sound	4,000	18,000	10,000	32,000	1,11	S1, S8, S11
103	assumed leak	0	59,000	0	59,000	1,2,3,8,10,11, 13,17,18,19	S9, S11, S24
104	sound	1,000	301,000	69,000	371,000	2,12,20	S8
105	assumed leak	0	40,000	266,000	306,000	12,20,21	
106	sound	1,000	116,000	0	117,000	2,3,4,8,10, 12,20,22	S2
107	assumed leak	1,000	164,000	0	165,000	11,12	S8, S22, S25
108	sound	0	94,000	0	94,000	11,12	S8,S11
109	sound	0	127,000	0	127,000	11,12	S4, S8, S11, S26
110	assumed leak	1,000	245,000	0	246,000	4,12,16,20, 23,24,25	
111	assumed leak	1,000	236,000	0	237,000	4,20,23,25	
112	assumed leak	3,000	30,000	0	33,000	20,25	S8, S11, S27, S28
201	assumed leak	1,990	28,000	0	29,000	26	
202	sound	0	27,000	0	27,000	16,27	
203	assumed leak	1,000	50,000	0	51,000	26	
204	assumed leak	1,000	49,000	0	50,000	24,26	

Notes:

Non-supernatant Waste Stream
1 = Bismuth phosphate metal waste
2 = Evaporator bottoms
3 = B Plant low-level waste
4 = Ion exchange waste (waste fractionization)
5 = Organic wash waste
6 = REDOX ion exchange waste
7 = Diatomaceous earth
8 = PNL waste
9 = N reactor waste
10 = Laboratory waste
11 = PUREX coating waste
12 = Bismuth phosphate first-cycle waste
13 = Tributyl phosphate waste
14 = In-tank solidification (ITS-2) bottoms & recycle sys
15 = First-cycle waste
16 = B Plant high-level waste
17 = REDOX high-level waste
18 = Coating waste
19 = Decontamination waste
20 = Bismuth phosphate second-cycle waste
21 = Flush water containing evaporator bottoms
22 = 224-U wastes
23 = Fission product waste
24 = B Plant flushes
25 = B Plant waste from cells 5 and 6
26 = 224-U wastes (lanthanum fluoride)
27 = 244-U wastes (lanthanum fluoride)

Supernatant Waste Stream
S1 = B Plant low-level waste
S2 = Tributyl phosphate waste
S3 = Inorganic wash waste
S4 = Coating waste
S5 = REDOX ion exchange waste
S6 = ARC-359 organic ion exchange resin
S7 = Metal Waste
S8 = Evaporator bottoms
S9 = Organic wash waste
S10 = Decontamination waste
S11 = Ion exchange waste
S12 = PUREX low-level waste
S13 = High-level waste
S14 = Sludge supernatant waste
S15 = REDOX high-level waste
S16 = Complexed and noncomplexed waste
S17 = Double-shell slurry feed
S18 = B Plant first-cycle waste
S19 = First-cycle waste
S20 = PUREX high-level waste
S21 = Portland cement
S22 = Bismuth phosphate first-cycle waste
S23 = Waste en route to ITS (4M Ci of strontium)
S24 = N Reactor waste
S25 = Bismuth phosphate second-cycle waste
S26 = 244-U waste
S27 = B Plant waste from cells 5 and 6
S28 = Fission product waste

In January 1980 and June 1981, tanks 107-B, 201-B, and 110-B were reclassified as confirmed leakers respectively (Schulz 1980, 1984). Tanks 241-B-104, 241-B-109, and 241-B-202 are listed as sound and have been interim isolated. Tanks 241-B-203 and 241-B-204 are listed as assumed leakers due to decreasing liquid levels. Environmental Protection Deviation Report 83-02 was issued in November 1983 because of evidence of liquid level decreases, settling of solids around the tank perimeter, and liner corrosion (Hanlon 1991b).

While pumping supernatant from tank 241-B-102 to tank 241-B-101, tank farm personnel noticed soil discoloration around the 241-B-102 heel pit indicating a leak in the tank transfer line. Surface soil contamination with readings of 10 R/h were recorded. The contaminated ground area was immediately covered with asphalt to reduce radionuclide migration. This UPR is reported as UPR-200-E-108.

Soil surrounding the 241-B-107 tank became contaminated in 1968 when approximately 8,000 gal of waste containing 2,000 Ci of cesium-137 leaked from tank 241-B-107 in 1968 (Cramer 1987). This UPR is recorded as UPR-200-E-127.

UPR-200-E-128 occurred in 1969 when approximately 8,300 gal of waste containing about 4,300 Ci of cesium-137 leaked from tank 241-B-110 contaminating the soil surrounding the tank (Cramer 1987).

In 1968, UPR-200-E-129 occurred when about 1,200 gal of waste containing approximately 420 Ci of cesium-137 leaked from tank 241-B-201 contaminating the soil surrounding and beneath the tank (Cramer 1987).

In 1982, modification of tanks 241-B-102, 241-B-103, 241-B-106, 241-B-108, and 241-B-112 for future use as ITS #1 and #2 evaporator bottom receivers was completed. Modifications to accept bottoms materials includes construction of new pump pits, insulation of transfer lines, installation of profile temperature facilities, and construction of an aboveground vessel vent system (Stalos and Walker 1977).

UPR-200-E-130 occurred between 1951 to 1977 consisting of about 300 gal of lanthanum fluoride escaping from tank 241-B-203 and contaminating the soil surrounding and beneath the tank (Cramer 1987).

At present, the tank farm is enclosed by a 6-ft-high chain link fence. The tanks are marked by yellow riser pipes and the ground surface is covered with gravel (site visit by Authors, September 1991).

9.2 241-B-151, 241-B-152, AND 241-B-153 DIVERSION BOXES, 241-B-301 CATCH TANK, UPR-200-E-4, UPR-200-E-6, UPR-200-E-38, AND UPR-200-E-74

The operational history, design, and location of these diversion boxes is similar and will therefore be discussed simultaneously. The boxes are located from about 35 to 120 ft south of the 241-B tank farm. These units transferred waste solutions from processing and decontamination operations to the 241-B and 241-BX tank farms. The units are interconnected by the 241-B-154 diversion box. Radionuclide inventories are not available; however records indicate that the concrete structures are potentially contaminated with high levels of alpha, beta, and gamma emitters. The boxes were in service from 1945 until June 1984, and are now isolated and weather covered (Hanford drawing H-2-44502, Sheet 12; Harmon et al. 1975; Cramer 1987).

UPR-200-E-38 occurred on January 4, 1968, when a waste line leading to the 241-B-152 diversion box leaked 221-B cell drain waste that caused a small cave in at the northeast corner of the box. The hole was backfilled greatly reducing dose rates from 5 R/h to 20 mrem/h. A small area of the southern portion of the 241-B tank farm affected by aerially deposited contaminants was also covered with clean soil (Maxfield 1979; Stenner et al. 1988).

Approximately 10 Ci of fission products were transported to the soil surrounding the 241-B-153 diversion box as the result of work performed on the unit in the fall of 1951 and summer of 1952. Most of the contaminated soil was removed and transported to a burial ground. The remaining contamination was covered with about 1 ft of clean soil (Maxfield 1973; Stenner et al. 1988). This UPR is designated UPR-200-E-4.

In 1954, UN-200-E-6 UPR resulted when waste containing about 1 Ci of fission products leaked from the 241-B-153 diversion box contaminating soil is the immediate vicinity (Stenner et al. 1988). No records regarding decontamination or cleanup were contained in BHI (1994).

Since the fall of 1951 leaks and spills from work on the 241-B-151 diversion box has contaminated soil surrounding the unit with approximately 10 Ci of fission products. Stenner et al. (1988) reports that most of the contaminated soil has been removed and the remaining contaminated areas covered with about 10 ft of clean soil. This UPR is documented as UPR-200-E-73.

UPR-200-E-74 occurred in the spring of 1954 when work on the 241-B-152 diversion box contaminated about 50 ft^2 of surface soil. About 1 Ci of mixed fission products was spread due to site activities. The contamination was removed and buried, several inches of clean fill were placed on the striped area, and rope and radiation zone signs delimited the area (Morton 1980; Stenner et al. 1988).

From 1954 to 1955, work on the 241-B-153 diversion box caused a general buildup of contamination around the unit. The contaminants contained about 1 Ci of fission products. The site was categorized as low-activity, covered with clean gravel and posted as a radiation zone, and documented as UPR-200-E-75.

9.3 241-B-252 DIVERSION BOX AND 241-B-301-B CATCH TANK

The unit transferred waste solutions from processing and decontamination operations between 1945 and June 1984. The unit is connected to the 241-BX-154 and 241-B-152 diversion boxes and the 241-B and 241-BY tank farms (Harmon et al. 1975; Cramer 1987).

Located adjacent to and below the diversion box is the 241-B-301-B catch tank that collects waste spilled in the box during transfers.

9.4 241-BR-152 DIVERSION BOX

Twenty-five feet south of the 241-BX tank farm is the 241-BR-152 diversion box. The unit transferred waste solutions of processing and decontamination operations from 1948 until June 1984 and is associated with the 241-BX tank farm. Radionuclide inventories were not available (Cramer 1987).

9.5 241-BX TANK FARM

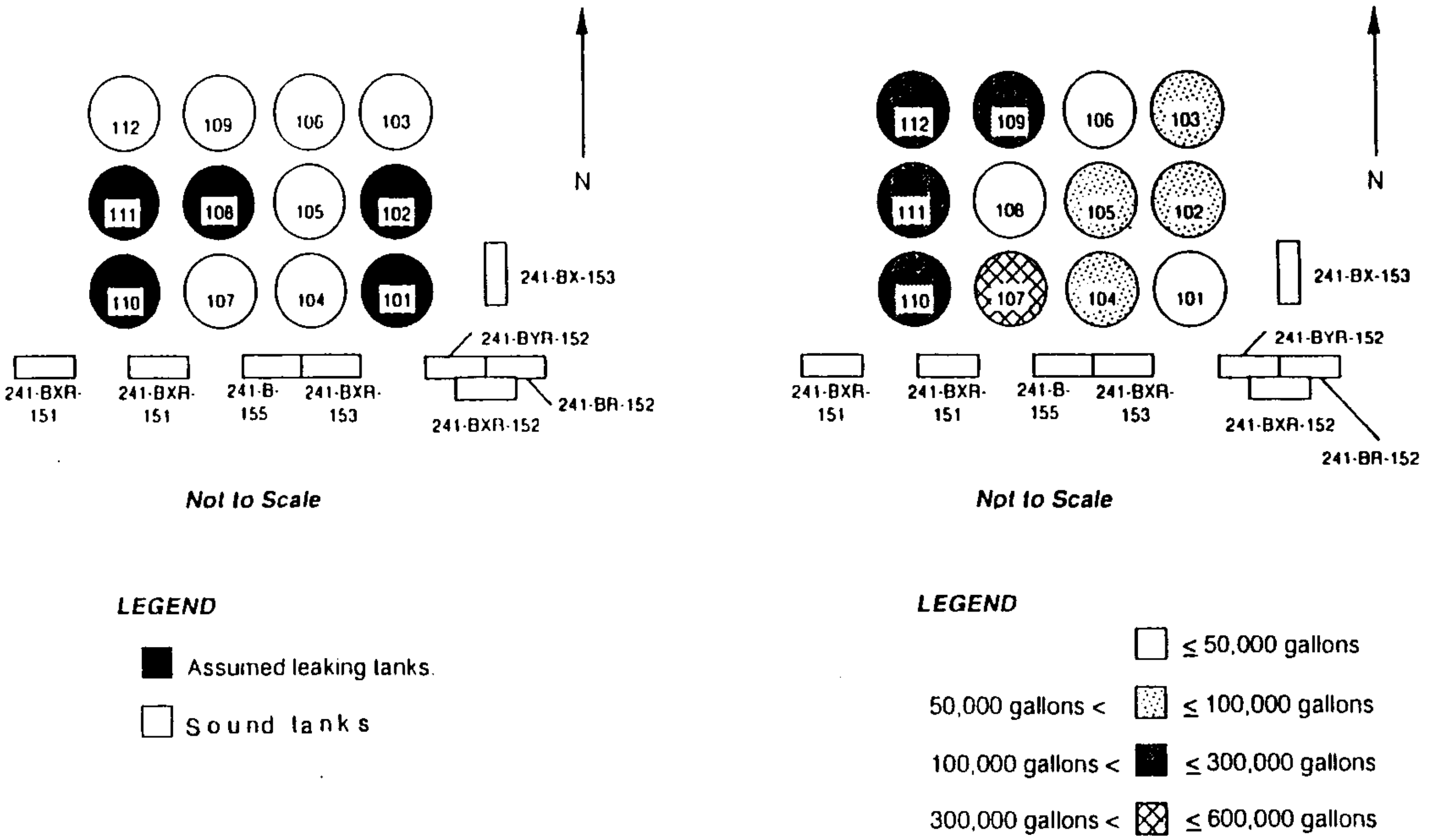
Immediately west of the B tank farm, on the west side of Baltimore Avenue is the 241-BX tank farm (Hanford photograph A-30). This tank farm consists of a series of buried single-shell, carbon-steel-lined, concrete-reinforced tanks containing mixed waste. It is located about 1,300 ft north northeast of the 221-B building adjacent to the southern boundary of the 241-BY tank farm and immediately west of the 241-B tank farm (Figure 9-5). The surface elevation is about 655 ft amsl with depth to groundwater between about 252 and 256 ft below ground surface (Stalos and Walker 1977).

There are 12, 533,000-gal tanks numbered 241-BX-101 through 241-BX-112. The tanks are inactive and have been isolated and interim stabilized. The operational history, design, and location of the tanks are similar and will therefore be treated as a single site. Individual tank summaries will follow this section, giving specific details on each tank, as well as the associated sites such as diversion boxes, catch tanks, and UPRs (Stalos and Walker 1977). Table 9-5 lists the quantities and types of waste contained in each tank of the tank farm.

The 241-BX tank farm was constructed to receive bismuth phosphate metal waste, B Plant low-level waste, ion-exchange waste (waste fractionation), reduction and oxidation (REDOX) ion-exchange waste from 241-BY, 241-BX, 241-B, 241-C tanks and other less voluminous wastes. The tanks are arranged in groups of three using the settling cascade concept, where waste solution is passed through a three-tank series to remove particulate matter. Cooling and precipitation occurred in each tank causing the bulk of the radionuclides to collect in the tank bottoms. To prevent radiogenic heating of the waste, air-cooled reflux condensers were installed to return the condensate to the tank and vent the noncondensable gases to the atmosphere (BHI 1994).

Tanks 241-BX-101, 241-BX-102, 241-BX-108, 241-BX-110, and 241-BX-111 were suspected leakers and removed from service. The remaining supernatant was transferred to a sound unit. 241-BX-102 was classified as a confirmed leaker in 1971 and an attempt was made to stabilize the unit by addition of diatomaceous soil. Tanks 241-BX-101, 241-BX-110, and 241-BX-112 were installed with P-10 salt well pumps to remove residual interstitial fluids (Larkin 1971; BHI 1994).

A plugged cascade outlet allowed about 22.5 tons of depleted uranium to escape contaminating the soil near the 241-BX-102 tank. This incident occurred on March 20, 1951, and has been designated UPR-200-E-5. No information regarding cleanup could be found (McCullugh and Cartmell 1968; Stenner et al. 1988).



A. Schematic diagram depicting individual tank integrity.

B. Schematic diagram depicting the quantity of total waste by individual tank in the BX Tank Farm.

Figure 9-5. The 241-BX Tank Farm Tank Integrity and Waste Volumes.

Table 9-5. Summary of 241-BX Tank Farm Waste Volumes and Waste Streams.

Tank	Status	Supernatant Liquid (gal)	Sludge (gal)	Saltcake (gal)	Total Waste (gal)	Waste Stream	Supernatant Waste Stream
101	assumed leak	1,000	42,000	0	43,000	1,2,3,4,5,6	S1, S2, S3, S4, S5, S6
102	assumed leak	0	96,000	0	96,000	1,7	S2, S4, S7, S8
103	sound	4,000	62,000	0	66,000	1,2,3,6,8,9,10	S2, S4, S7, S9, S10, S11, S12
104	sound	3,000	96,000	0	99,000	1,2,4,11	S1, S2, S11, S15, S16, S17
105	sound	5,000	43,000	3,000	51,000	1	S2, S4, S7, S8, S11, S16, S17
106	sound	15,000	31,000	0	46,000	1	S1, S2, S4, S5, S7, S8, S9, S11
107	sound	1,000	344,000	0	345,000	12,13	S11
108	assumed leak	0	26,000	0	26,000	12	S2, S4, S11
109	sound	0	193,000	0	193,000	4,12,13	S2
110	assumed leak	1,000	189,000	9,000	199,000	2,4,12	S4, S8, S18
111	assumed leak	19,000	68,000	143,000	230,000	2,12,14	S4, S11, S19
112	sound	1,000	164,000	0	165,000	2,4	S4, S8, S19

UPR-200-E-131 occurred at 241-BX-102 from 1948 until 1971 resulting from a leak allowing about 51,000 Ci of cesium-137 contained in high-level, nonboiling liquid wastes to seep into the underlying soil. An estimated 31,000 ft^3 of soil has been affected extending to a depth of 120 ft. According to Larkin (1971), some of the contaminants may have spread to groundwater during drilling of a monitoring well.

In 1974, UPR-200-E-132 occurred when 2,500 gal of waste leaked from the BX-102 tank contaminating the ground around the unit. The area was excavated and after a radiation survey, backfilled with clean soil (Stenner et al. 1988).

UPR-200-E-133 resulted when about 2,500 gal of waste containing 500 Ci of cesium-137 leaked from the BX-108 tank. This incident occurred between 1949 and 1974 contaminating soil around and beneath the tank. Information concerning cleanup action was not available (Cramer 1987).

Tank 241-BX-103 was documented as having contaminated soil in the vicinity of dry wells 21-03-03, 21-03-05, and 21-03-12 and is believed to be from tank overflow and spillage some years ago. It is estimated that 30,000 to 90,000 gal of waste were spilled to the ground between tanks BX-102 and BX-103 in 1951. It is uncertain why a UPR number was not assigned to this unit (Stalos and Walker 1977; Hanlon 1991b).

Tanks 241-BX-104, and 241-BX-106 through 241-BX-112 are listed as sound and have been partially interim isolated. Tank 241-BX-105 is listed as sound and is partially interim isolated (Hanlon 1991b)

At present the tank farm is surrounded by a chain link fence, topped with three strands of barbed wire. The ground surface is covered with gravel and no vegetation is seen (site visit by authors, September 1991).

9.6 241-BX-153 DIVERSION BOX AND 241-BX-302A CATCH TANK

This is an inactive waste site located at the southern boundary in the 241-BX tank farm. The site was in service from 1948 until June 1983 transferring waste solutions from processing and decontamination operations. Located adjacent to and below the diversion box is the 241-BX-302A catch tank that collects waste spilled in the box during transfers (Cramer 1987). Both units have been isolated and weather covered (Hanlon 1990). The site interconnects the 241-B-152 and 241-B-155 diversion boxes and 241-BX and 241-BY tank farms. Radionuclide inventories were not available for this site (Harmon et al. 1975; Cramer 1987).

9.7 241-BXR-151 DIVERSION BOX

The 241-BXR-151 diversion box is an inactive waste site located at the southern boundary in the 241-BX tank farm. The site was in service from 1948 until June 1984 transferring waste solutions from processing and decontamination operations. Radionuclide inventories were not available. This site is associated with the 241-BX tank farm where leak detection and air monitoring are performed continuously. The unit has been isolated and weather coated (Cramer 1987).

9.8 241-BXR-152 DIVERSION BOX AND 241-BX-302A CATCH TANK

The 241-BXR-152 diversion box is an inactive waste site located at the southern boundary in the 241-BX tank farm. The site was in service from 1948 until June 1984 transferring waste solutions from processing and decontamination operations. Radionuclide inventories were not available. This site is associated with the 241-BX tank farm where leak detection and air monitoring are performed continuously. The unit has been isolated and weather coated (Cramer 1987).

Located about 200 ft northeast of the diversion box in the 241-BX tank farm is the 241-BX-302-A catch tank, which collects waste spilled in the box during waste transfers. This catch tank is more closely associated with diversion box 241-BX-153 (see Section 9.6). The unit was in operation from 1948 until July 1985. This unit has been isolated and weather covered (Cramer 1987; Hanlon 1990).

9.9 241-BXR-153 DIVERSION BOX

The 241-BXR-153 diversion box is an inactive waste site located at the southern boundary in the 241-BX tank farm. The site was in service from 1948 until June 1984 transferring waste solutions from processing and decontamination operations. Radionuclide inventories were not available. This site is associated with the 241-BX tank farm where leak detection and air monitoring are performed continuously. The diversion box interconnected the 241-B-152 and 241-B-155 diversion boxes and the 241-BX and 241-BY tank farms. The unit has been isolated and weather coated (Cramer 1987).

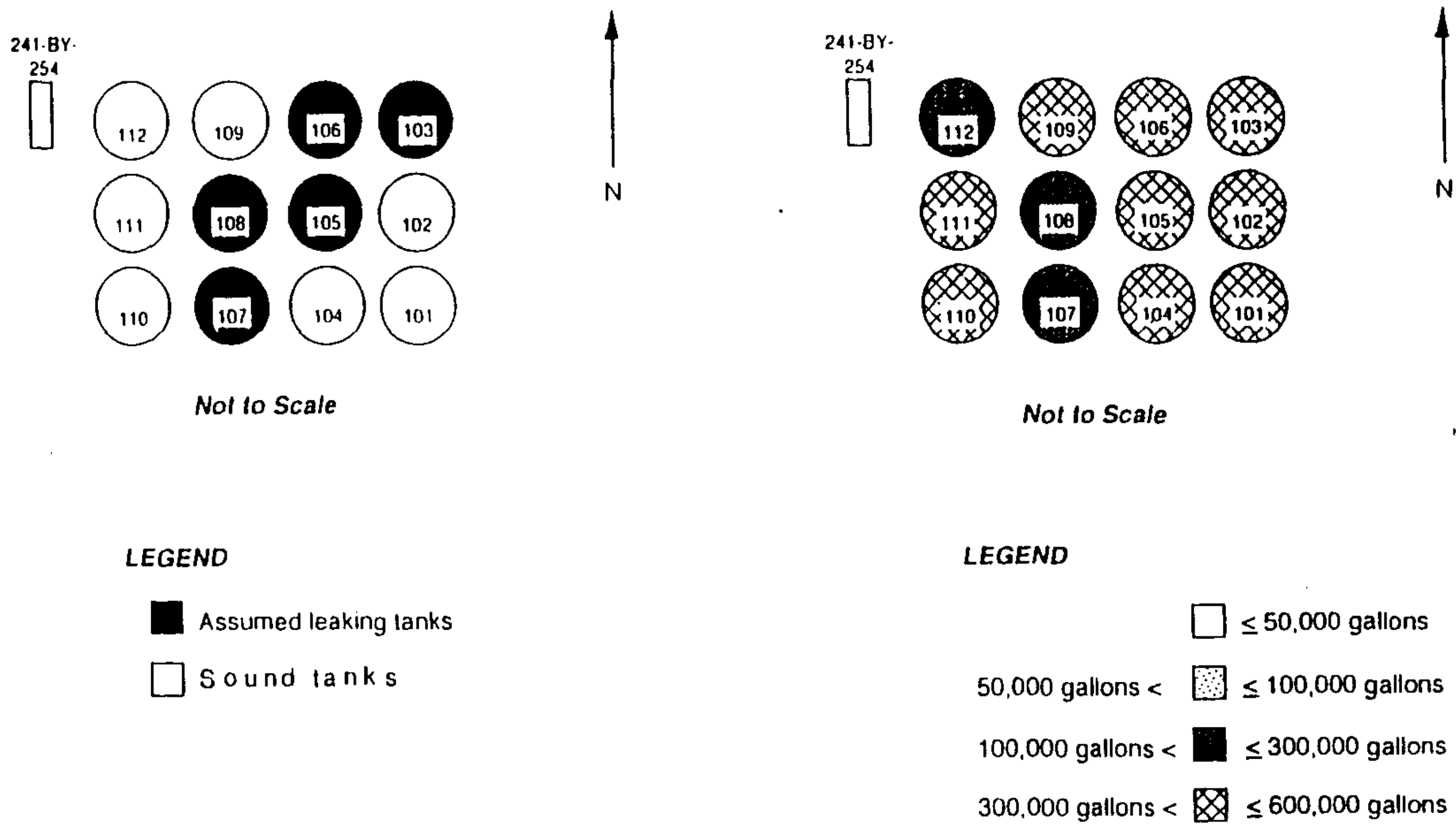
9.10 241-BY TANK FARM

The 241-BY tank farm consists of a series of buried single-shell, carbon-steel-lined, concrete-reinforced tanks containing mixed waste. It is located about 2,000 ft north of the 221-B building and is adjacent to the northern boundary of the 241-BX tank farm. The surface elevation is about 648 ft amsl with groundwater about 246 ft below ground surface (Stalos and Walker 1977).

There are 12, 750,000-gal tanks in the farm numbered 241-BY-101 through 241-BY-112. All the tanks are inactive and each has undergone initial stabilization and isolation (Figure 9-6). The operational history, design, and location of the tanks are similar and will therefore be treated as a single site. Individual tank summaries will follow this section, giving specific details on each tank, as well as the associated sites such as diversion boxes, catch tanks, and UPRs (Stalos and Walker 1977; WHC 1988). Table 9-6 summarized the types and quantities of waste in each tank in the 241-BY tank farm.

The 241-BY tank farm was constructed to receive nonboiling wastes from the 221-B building.

The tanks are arranged in groups of three utilizing the settling cascade concept in which waste solutions were passed in series through three tanks. Cooling and precipitation occurred in each tank causing the bulk of the radionuclides to collect in the tank bottoms. To prevent heating of the wastes, air-cooled reflux condensers were installed that return the condensate to the tank and vent the noncondensable to the atmosphere. Four major tank waste streams generated by the bismuth phosphate plutonium recovery process conducted in the 221-B building until 1956 were sent to the tank farm. The first, metal waste containing all of the uranium and 90% of the original fission



A. Schematic diagram depicting individual tank integrity.

B. Schematic diagram depicting the quantity of total waste by individual tank in the BY Tank Farm.

Figure 9-6. 241-BY Tank Farm Tank Integrity and Waste Volumes.

Table 9-6. Summary of 241-BY Tank Farm Waste Volumes and Waste Streams.

Tank	Status	Supernatant Liquid (gal)	Sludge (gal)	Saltcake (gal)	Total Waste (gal)	Waste Stream	Supernatant Waste Stream
101	sound	0	109,000	278,000	387,000	1	S2, S8
102	sound	15,000	0	417,000	432,000	1	S2, S4, S8
103	assumed leak	0	5,000	395,000	400,000	1,11	S2, S4, S8, S9, S20
104	sound	0	40,000	366,000	406,000	1,13	S2, S8, S11
105	assumed leak	0	44,000	459,000	503,000	1,13	S2, S4, S8, S21
106	assumed leak	0	95,000	547,000	642,000	13,15	S2, S4, S8, S22
107	assumed leak	0	60,000	206,000	266,000	1,13	S2, S4, S8
108	assumed leak	0	154,000	74,000	228,000	12,13	S2, S8
109	sound	33,000	87,000	354,000	474,000		S2, S4, S7, S8, S9
110	sound	0	103,000	295,000	398,000	12,13	S2, S4, S8
111	sound	0	21,000	438,000	459,000	1,5,11,13	S2, S4, S8, S9
112	sound	0	5,000	286,000	291,000	1,13	S2, S4, S8

Notes:

Non-supernatant Waste Stream
1 = Bismuth phosphate metal waste
2 = Evaporator bottoms
3 = B Plant low-level waste
4 = Ion exchange waste (waste fractionization)
5 = Organic wash waste
6 = REDOX ion exchange waste
7 = Diatomaceous earth
8 = PNL waste
9 = N reactor waste
10 = Laboratory waste
11 = PUREX coating waste
12 = Bismuth phosphate first-cycle waste
13 = Tributyl phosphate waste
14 = In-tank solidification (115-2) bottoms & recycle sys
15 = First-cycle waste

Supernatant Waste Stream
S1 = B Plant low-level waste
S2 = Tributyl phosphate waste
S3 = Inorganic wash waste
S4 = Coating waste
S5 = REDOX ion exchange waste
S6 = ARC-359 organic ion exchange resin
S7 = Metal Waste
S8 = Evaporator bottoms
S9 = Organic wash waste
S10 = Decontamination waste
S11 = Ion exchange waste
S12 = PUREX low-level waste
S13 = High-level waste
S14 = Sludge supernatant waste
S15 = REDOX high-level waste
S16 = Complexed and noncomplexed waste
S17 = Double-shell slurry feed
S18 = B Plant first-cycle waste
S19 = First-cycle waste
S20 = PUREX high-level waste
S21 = Portland cement
S22 = Bismuth phosphate first-cycle waste

products activity. The second, coating waste from dissolution of aluminum cladding of fuel rods containing small amounts of fission products. The third, first-cycle decontamination waste containing less than 0.1% of the fission product activity and 1% of the plutonium. The fourth, second-cycle decontamination waste containing less than 0.1% of the fission activity and 1% of the plutonium.

Other less voluminous waste sources were the waste streams containing bismuth phosphate metal waste and supernatant containing TBP waste and evaporator bottoms from the 241-BY and 241-C tank farms. All the tanks were used as part of the ITS #1 and #2 evaporation project (Stalos and Walker 1977; Jungfeisch 1983).

Tanks BY-101 and BY-102 are listed as sound and have been partially interim isolated (Stalos and Walker 1977; Hanlon 1991). Tank BY-103 is listed as an assumed leaker in BHI (1994) and has been partially interim isolated. UPR-200-E-134, consisting of about 5,000 gal of PUREX coating waste leaked from tank 241-BY-103 contaminating the soil surrounding and underneath the tank. The tank was registered as a confirmed leaker in May 1973 (Cramer 1987; Hanlon 1991b).

Tank BY-104 is categorized as sound and has been interim isolated. On February 23, 1991, this unit had a maximum temperature of 129 °F (Hanlon 1991a and 1991b).

In November 1966, 63 tons of Portland cement were added to tank BY-105 (assumed leaker) to determine the immobilization properties of the cement. The tank was then connected to an exhaust system for temperature control. A maximum temperature of 146 °F was recorded 4 in. above the bottom liner (Hanlon 1991a and 1991b).

Tanks 241-BY-106 and 241-BY-107 are classified as assumed leakers. 241-BY-106 has been partially interim isolated and 241-BY-107 has undergone interim isolation (Hanlon 1991a and 1991b).

Tank 241-BY-108 is classified as an assumed leaker and has been partially interim stabilized. Between 1955 and 1972, approximately 5,000 gal of TBP waste leaked from the tank contaminating the soil surrounding and underneath the tank. This leak was documented as UPR-200-E-135 (Stalos and walker 1977; Cramer 1987).

Tanks 241-BY-109 through 241-BY-112 are all listed as sound and have been partially interim isolated. UPR-200-E-116 occurred on November 20, 1972, when an unknown volume of caustic flush water containing cesium-137, yttrium-90, strontium-89, and strontium-90 sprayed from the BY-112 pump associated with the BY-112 tank. Radiation levels up to 3 R/h were measured 6 in. above the waste.

9.11 241-BYR-152 DIVERSION BOX

Located at the southern boundary within the 241-BX tank farm the 241-BYR-152 diversion box is an inactive waste site that operated from 1950 until June 1984 transferring waste solutions from processing and decontamination operations. Radionuclide inventories were not available. Leak detection and air monitoring are performed continuously within the tank farm in which it is located. The box has been isolated and weather covered (Cramer 1987).

9.12 241-BYR-153 DIVERSION BOX

The 241-BYR-153 diversion box is an inactive waste site associated with the 241-BY tank farm located at the southern boundary in the 241-BX tank farm. The unit was in operation from 1950 until June 1984 transferring waste solutions from processing and decontamination operations. The box has been isolated and weather covered. Radionuclide inventories were not available. Leak detection and air monitoring are performed continuously within the tank farm in which the unit is located (Cramer 1987).

9.13 241-BYR-154 DIVERSION BOX

The 241-BYR-154 diversion box is an inactive waste site associated with the 241-BY tank farm located at the southern boundary in the 241-BX tank farm. The unit was in operation from 1950 until June 1984 transferring waste solutions from processing and decontamination operations. The box has been isolated and weather covered. Radionuclide inventories were not available (BHI 1994). Leak detection and air monitoring are performed continuously within the tank farm in which the unit is located (Cramer 1987).

9.14 242-B-151 DIVERSION BOX

Located at the southern boundary of the 241-B tank farm the 242-B-151 diversion box is an inactive waste site that operated from 1945 until June 1984 transferring waste solutions from processing and decontamination operations. Radionuclide inventories were not available for this site (BHI 1994).

9.15 244-BXR RECEIVING VAULT

The 244-BXR receiving vault is an inactive waste site located at the southern boundary in the 241-B tank farm. The unit was in operation from 1948 until July 1985 transferring waste solutions from processing and decontamination operations. The unit has been isolated and weather covered. Radionuclide inventories were not available for this site (BHI 1994). Leak detection and air monitoring are performed continuously within the tank farm in which the unit is located (Cramer 1987).

9.16 2607-EB SEPTIC TANK AND TILE FIELD

This waste site was activated in 1951 and is currently generating about 0.02 m^3 of sanitary wastewater and sewage per day. The site is listed as nonhazardous nonradioactive in BHI (1994) (Cramer 1987).

Adjacent to the septic tank is a drain field composed of VCP, concrete pipe, or drain tile forming the main line and laterals from the tank. The approximate location is listed on Hanford drawing H-2-44500, Sheet 6, but can not be found on detailed Hanford drawing H-2-445001, Sheet 151.

9.17 UN-200-E-43 UNPLANNED RELEASE

This UPR occurred on January 10, 1972, when liquid from the 102-BY pump leaked on a section of roadway while in transit to a burial ground. Beta gamma contamination with reading from 1,000 to 100,000 c/m were recorded. Decontamination of the affected area began immediately (Stenner et al. 1988).

9.18 UN-200-E-76 UNPLANNED RELEASE

On January 4, 1968, a leak from the a waste line connecting the 9-2 tank in the 221-B building and the 110-B underground storage tank contaminated soil near the 241-B-153 diversion box. The release consisted of solution containing about 4,780 Ci of cerium-144, 340 Ci of ruthenium-106, and 850 Ci of zirconium-95 and niobium. The site was covered with clean gravel (Maxfield 1979).

9.19 UN-200-E-79 UNPLANNED RELEASE

This UPR occurred in June 1953 and consists of five areas corresponding to five leaks in the waste line that runs from 242-B to 207-B. This is a low activity site containing about 10 Ci of mixed fission products with contamination levels up to 2,500 c/m measured at the point of emission of water from the ground (Maxfield 1979). Information concerning cleanup actions or plans was not present in available material. The actual location of the UPR is unknown. The area is believed to have been stabilized (site visit by authors, November 1991).

9.20 UN-200-E-101 UNPLANNED RELEASE

An area located between the 242-B evaporator and 241-B tank farm fence was established as a UPR in 1986. An unknown amount of contamination was discovered in this area and in weeds growing in and around the zone. The weeds were removed and the area released from temporary status (Morton 1980; Cramer 1987). Contaminated particulate emissions from the 241-B tank farm has been a source of contamination in areas adjacent to the facilities and may have contributed to this UPR (Environmental Protection, personal communication 1991).

9.21 UN-200-E-105 UNPLANNED RELEASE

On December 15, 1952, about 23,000 gal of first-cycle liquid waste escaped from the 107-BY manifold header at the 107-BY tank farm. After evaluating the spill it was deemed impractical to decontaminate the area and was instead covered with concrete (HW-26653).

9.22 UN-200-E-109 UNPLANNED RELEASE

On November 11, 1953, about 150 gal of concentrated TBP waste were released from the 104-B tank at the 241-B tank farm. About 300 ft^2 area was contaminated to 1 R/h. The area was roped off and restricted until stabilized with asphalt (Stenner et al. 1988).

10.0 OPERABLE UNIT 200-BP-8

There are eight sites in Operable Unit 200-BP-8, located in the northeastern portion of the 200 East Area (Figures 1-1 and 6-1). Four of these sites are or were ditches leading to the B pond. Table 10-1 summarized the current operational status, location, and type of waste associated with each site. In addition, the operational history of each site is also depicted in Figure 10-1.

Table 10-2 provides operational data, dimensions, and waste volumes. Table 10-3 provides a summary of current site conditions based on several site visits performed by the authors during September and October 1991. There were no organic and inorganic contaminants identified in BHI (1994) associated with the sites of this operable unit.

10.1 207-B RETENTION BASIN/UPR-200-E-32

The 207-B retention basin is an active retention basin for low-level liquid waste in route to the active 216-B-63 trench located east of the structure. The 216-B-2 series ditches, which are parallel to the 216-B-63 ditch, were initially used to dispose of liquid waste from the retention basin. After each ditch in the 216-B-2 series was decommissioned and stabilized, the 216-B-63 trench became the main disposal unit for liquid wastes routed through the 207-B retention basin (BHI 1994). The basin is located 2,000 ft northeast of B Plant, immediately south of the B tank farm (Hanford photograph A-31).

The structure was designed to take only low-level liquid wastes. The concrete walls of the unit have been contaminated over the years by a number of incidents involving radioactive water releases during its long service history. In 1953, the walls were covered with a coat of tar to seal the residue contamination (Maxfield 1979).

On November 7, 1963, the 207-B retention basin was contaminated with the cesium-rare earth fraction of fission products of the fission product stream, primarily cerium-144, after a coil leak developed in the 221-B building 6-1 tank (UPR-200-E-32) (Maxfield 1979). After damming the 216-B-2-1 ditch 1,000 ft from its head, the contaminated basin water was flushed into the ditch. The total volume of liquid to be discharged to the ditch during this incident was estimated to be 1,300,000 gal, 1,100,000 gal of which were low activity level cooling water. A sample was taken and analyzed to estimate the amount of activity released. The cesium-141 content was determined insignificant. Only cesium-144 (30 Ci) and strontium-90 (.05 Ci) were considered pertinent (BHI 1994; Maxfield 1979). Another source estimated that less than 1/2 L of highly contaminated waste from the B Plant 6-1 tank contents was discharged to the retention basin (Maxfield 1979).

Immediate cleanup actions were taken. One thousand feet of the 216-B-2-1 ditch was backfilled and replaced with a new ditch, presumably 216-B-2-2 based on its start-up date. The retention basin walls were decontaminated by washing them down repeatedly with fire hoses, and then they were coated with an asphalt-oil emulsion. Fresh dirt was spread over the backfilled ditch and around the contaminated soils adjacent to the retention basin.

Table 10-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-8.

Site	Type of Site	Status	Coordinates	Type of Waste
207-B RB	Retention Basin	Active	N44600 W52500	Low-Level Waste
216-B-2-1	Ditch	Inactive	N44975 W51900 (head), N44175 W48550 (end)	Mixed Waste
216-B-2-2	Ditch	Inactive	N44930 W51990 (head), N44180 W48525 (end)	Mixed Waste
216-B-2-3	Ditch	Inactive	N44650 W52325 (head), N44175 W48575 (end)	Low-Level Waste
216-B-63	Ditch	Active	N45110 W51793, N44635 W50254 (centerline)	Mixed Waste
2607-E9	Septic Tank	Active	N44875 W52350	Nonhazardous/Nonradioactive
UPR-200-E-138	Unplanned Release	Inactive	N44930 W51990	Mixed Waste
UPR-200-E-32	Unplanned Release	Inactive	N44600 W52400	Mixed Waste

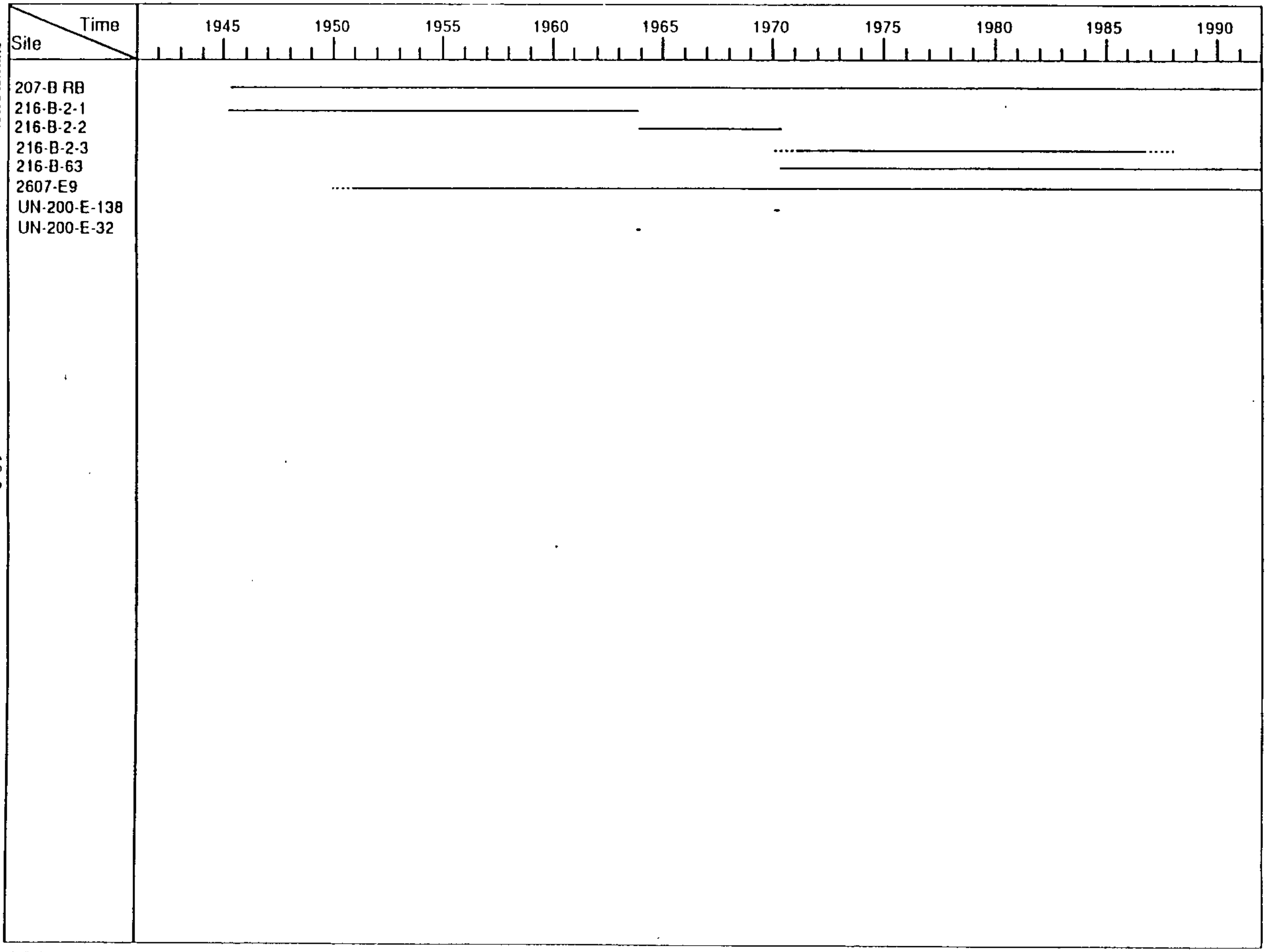


Figure 10-1. Summary of Operational Periods for Operable Unit 200-BP-8.

Table 10-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-8.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
207-B RB	Liquid	April 1945	Active		Top	246	123	7	0	0	0 00	UPR-200-E-32
216-B-2-1	Liquid	April 1945	November 1963		Top	3500	15	6	3900	149000000000	0 00	UPR-200-E-32
216-B-2-2	Liquid	November 1963	May 1970		Top	2350	15	6	4100	49700000	45 30	UPR-200-E-138
216-B-2-3	Liquid	1970	1987		Top	4000	20	8	1900	0	0 00	
216-B-63	Liquid	March 1970	Active		Bot	1400	4	10	590	7220000000	0 00	
2607-E9	Liquid	1951	Active		Top	0	0	0	0	0	0 00	
UPR-200-E-138	Liquid			March 22, 1970	Top	0	0	0	0	0	0 00	
UPR-200-E-32	Liquid			November 7, 1963	Top	0	0	0	0	0	1 09	

Table 10-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-8.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad. Zone (sq ft)
207-B Retent B	Chain Link Fence	Underground Contamination	None	None/Unknown	-5.0	None	Inside Tank Farm	22343	22343
216-B-2-1	None	Underground Contamination	None	Gravel/Soil Cover	1.0	Brush/Grass	None	100	61670
216-B-2-2	None	Underground Contamination	None	Gravel/Soil Cover	1.0	Brush/Grass	None	100	61670
216-B-2-3	None	Underground Contamination	None	Gravel/Soil Cover	1.0	Brush/Grass	None	100	61670
216-B-63	Light Chain	Surface Contamination	Metal Post with Plaque	None/Unknown	-5.0	Brush/Grass	None	0	0
2607-ES	Light Chain	Surface Contamination	None	None/Unknown	0.0	Brush/Grass	None	0	0

Some tumbleweeds that had collected in the 207-B retention basin at the time of the UPR were contaminated and removed and disposed of. An 8-ft chain link fence was erected around the basin later that same month as a corrective action to stop tumbleweeds from getting into the basin (Maxfield 1979).

The 207-B retention basin is currently active and in use. Some spots with 200 to 600 c/m levels of contamination have been detected on the north side of the basin. Except for these spots perimeter surveys of the basin indicate only normal background levels of radiation (BHI 1994).

10.2 216-B-2-1, 216-B-2-2 (UPR-200-E-138), 216-B-2-3, AND 216-B-63 DITCHES

East of the 207-B retention basin lie four parallel ditches, three are inactive (the 216-B-2 series) but the 216-B-63 ditch is in use (site visit by authors, September 1991). These three inactive ditches were used to transfer waste mainly from the 284-E powerhouse, 241-CR vault, and 221-B building, via the 207-B retention basin, to the 216-B-3 pond (B Pond) (Stenner et al. 1988). The 216-B-63 ditch receives effluent from the 221-B, 225-B, and 271-B building floor drains and chemical sewer wastes via the 207-B retention basin (Cramer 1987). The 216-B-63 ditch terminates near the 218-E-12B burial ground, however, and does not have a direct pathway to B pond (Hanford photograph A-32). Since the ditches were not lined, they all functioned as percolation waste disposal sites in addition to transport sites. Further, authors believe the 207-B retention basin can be bypassed in route to the ditches. One reference discussed below states that the 207-B retention basin was bypassed to avoid contaminating it during the UPR-200-E-138 release.

With the exception of two UPRs, UPR-200-E-32 associated with 216-B-2-1 (see Section 10.1) and UPR-200-E-138 associated with 216-B-2-2 (discussed below), all four ditches have received only low-level liquid wastes such as cooling water, steam condensate, and chemical sewer. An unknown portion of all waste received by the 216-B-2 ditch series did collect in B pond. The active 216-B-63 ditch was dredged in August 1970 (Maxfield 1979) and is reported not to have received dangerous waste since September 1985 (DOE-RL 1988). The tailings from the dredging were buried in the 218-E-12B burial grounds.

UPR-200-E-138 occurred on March 22, 1970. An estimated release of 1,000 Ci of strontium-90 occurred while attempting to measure the liquid level of product storage tank 8-1. The waste was sprayed down with several small water hoses on the B Plant floor drain and chemical sewer, that led to the 216-B-2-2 ditch and the 216-B-3 pond (Maxfield 1979). The 207-B retention basin was bypassed and was not contaminated as a result of this UPR. On March 23, 1970, earthen dams were built to keep as much contamination out of B pond as possible. Radiation levels of 500 R/h 3 in. from the pipe gallery existed. Water samples from the B pond reached a maximum strontium-90 concentration of 1.7 by 10^{-3} μCi/ml (Maxfield 1979).

After each of the UPRs directly related to the 216-B-2 series ditches (UPR-200-E-32 and UPR-200-E-138) occurred, the associated ditch was decommissioned by backfilling and placing fresh soil over the surface (BHI 1994) (Hanford photographs A-33 and A-34). A plastic weed root barrier was placed over the 216-B-2-1 ditch after backfilling and covered with 18 in. of sand and 4 in. of gravel to prevent erosion by wind (Maxfield 1979) (Hanford photograph A-35). Recent radiological surveys of the area have resulted in nondetectable readings only except for a small area of 100,000 dis/min associated with the 216-B-2-2 trench (BHI 1994).

10.3 2607-E9 SEPTIC TANK

The 2607-E9 septic tank and associated drain field, adjacent to the 207-B retention basin, is a sanitary wastewater and sewage system. Liquid wastes received by the unit are nonhazardous and nonradioactive. Building 242-B is the waste source for the 2607-E9 septic tank (Hanford drawing H-2-44501, Sheet 128). The area east of the 242-B building where the 2607-E9 septic tank and associated drain field are located is light chain barricaded with surface contamination warning signs. Contaminated particulate releases from the B tank farm is the most likely source for the surface contamination (Environmental Protection, personal communication 1991).

11.0 OPERABLE UNIT 200-BP-9

Operable Unit 200-BP-9 abuts the western perimeter fence of the 200 East Area (Figures 1-1 and 8-1). There are four active and five inactive sites (Table 11-1) in 200-BP-9 and the proposed site for the Hanford Waste Vitrification Plant lies within this operable unit. The 216-B-64 retention basin, which was never used, and crib 216-B-12, which has a migration hazard rank of 62.92, are indicative of the wide range in quantities of waste disposed in this operable unit. Except for the two UPRs and pit 200-CP all the sites in this unit were operational for extended periods of time (Table 11-2). A graphical summary of the operational history of the individual sites is presented in Figure 11-1.

Table 11-3 provides a summary of current site conditions based on several site visits performed by the authors during September and October 1991. A list of the organic and inorganic contaminants that were part of the waste disposed in the area is given in Table 11-4. This data was extracted from BHI (1994) and has not been validated by the authors. It should be used as a guideline only.

11.1 200 AREA CONSTRUCTION PIT

From 1945 through 1955, a large gravel pit located west of the 200 East Area fence was used as a nonhazardous solid waste pit for broken blocks of concrete foundation and other structures (BHI 1994). There have been no known chemicals dumped into this unit (Stenner et al. 1988). The pit has been abandoned. Native vegetation now grows in and around the pit excavation (site visit by authors, October 1991).

11.2 216-B-12 CRIB

Located 1,000 ft northwest of 221-B building, the 216-B-12 crib operated from November 1952 through December 1957 and from May 1967 through November 1973. The crib was inactive between December 1957 through May 1967. Radiation Occurrence Report 73-82 suggests the 216-B-12 crib was abandoned on November 1973 when the ground above the crib started to subside resulting in flow restrictions. The site was backfilled in 1973 and the fill line was capped March 1974 (Maxfield 1979). Cave-in potential is still of concern (Hanford photograph A-36).

During its service history, the crib received process condensate from the waste evaporators in the 221-U and 224-U buildings until December 1957; construction waste from 221-B building May 1967 to November 1967; process condensate from 221-B building after November 1967 (Stenner et al. 1988). The waste is low salt and neutral/basic. Inorganics disposed at this site include ammonium nitrate (Stenner et al. 1988). Radionuclides present in the monitoring wells associated with the structure include: cesium-137, ruthenium-106, strontium-90, tritium, and cobalt-60, and plutonium-239 (Brown et al. 1990; Aldrich 1984).

The design of this crib is slightly unusual because it consists of a series of three cascading wooden boxes.

Table 11-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-9.

Site	Type of Site	Status	Coordinates	Type of Waste
200 CP	Pit	Inactive	N43250 W57000, N44750 W57000 (centerline)	Nonhazardous/Nonradioactive
216-B-12	Crib	Inactive	N42980 W55000, N43140 W55000 (centerline of width)	Mixed Waste
216-B-55	Crib	Active	N42497 W54810, N42920 W55431 (centerline)	Low-Level Waste
216-B-62	Crib	Active	N43580 W54995, N43934 W55349 (centerline)	Low-Level Waste
216-B-64	Retention basin	Inactive	N42572 W54614, N42773 W54546 (centerline)	Nonhazardous/Nonradioactive
241-ER-151	Diversion Box	Active	N41985 W54724	Mixed Waste
241-ER-311	Catch Tank	Active	N41937 W54702	Mixed Waste
UN-200-E-64	Unplanned Release	Inactive	N42550 W54600	Mixed Waste
UPR-200-E-84	Unplanned Release	Inactive	N41937 W54702	Mixed Waste

Table 11-2. Operational Dates and Status, site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-9.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
200 CP	Solid	1945	1955		Top	1500	500	20	0	0	0.00	
216-B-12	Liquid	November 1952	November 1973		Bot	160	50	26	3000	520000000	62.92	
216-B-55	Liquid	September 1967	Active		Bot	750	10	12	1700	1230000000	0.00	
216-B-62	Liquid	November 1973	Active		Bot	500	10	16	950	282000000	0.00	
216-B-64	Liquid	Never Used	Never Used		Bot	142	20	15	0	0	0.00	
241-ER-151	Liquid	1945	Active		Top	0	0	0	0	0	0.00	UPR-200-E-84
241-ER-311	Liquid	1945	Active		Top	0	0	0	0	0	0.00	
UN-200-E-64	Liquid			October 12, 1984	Top	0	0	0	0	0	0.00	
UPR-200-E-84	Liquid			March 1953	Top	0	0	0	0	6435	1.04	

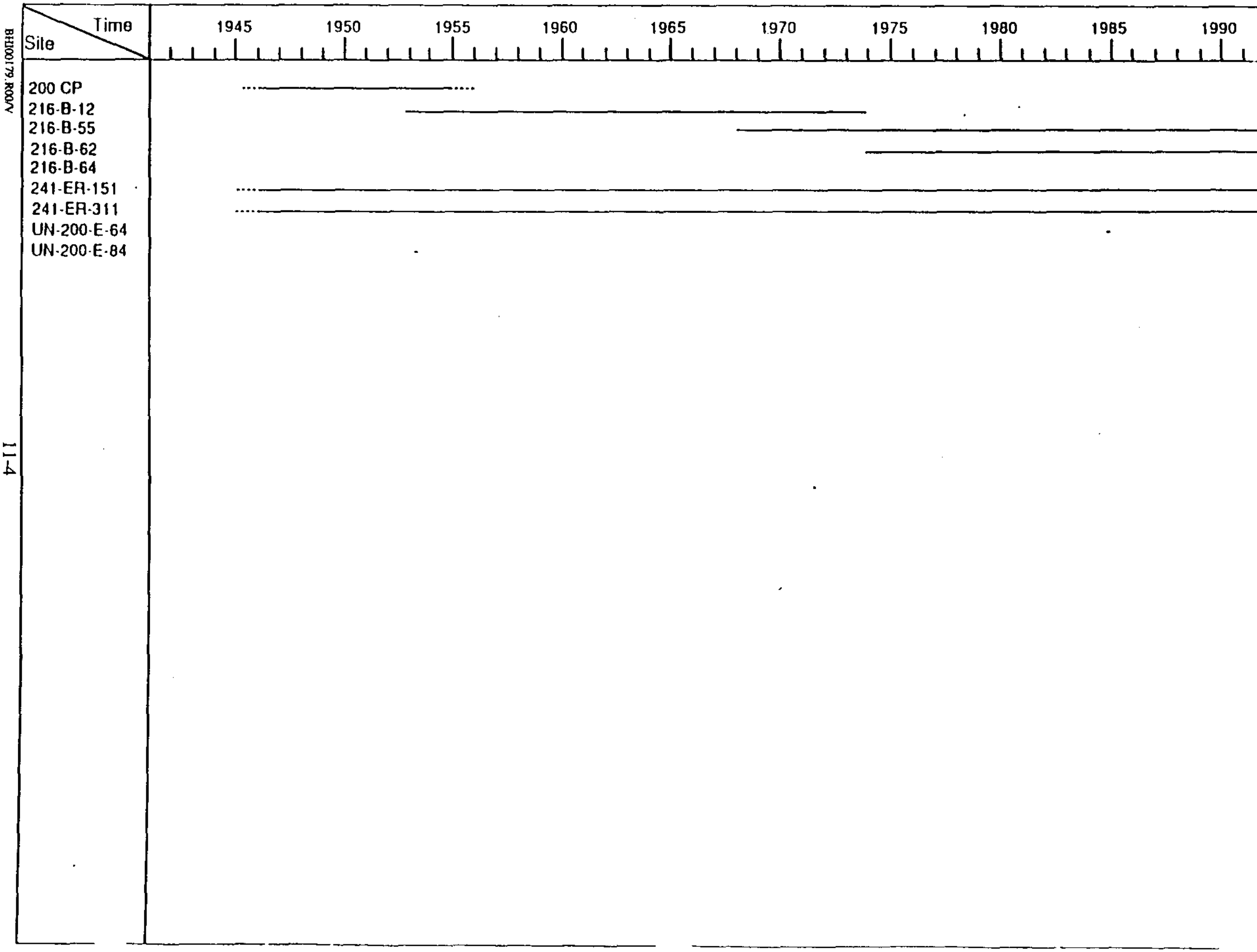


Figure 11-1. Summary of Operational Periods for Operable Unit 200-BP-9.

Table 11-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-9.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad Zone (sq ft)
200 Area Const	None	None	None	None/Unknown	-8.0	Brush/Grass	None	0	0
216-B-12	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Gravel/Soil Cover	2.0	Trace/Few Plants	None	16000	16000
216-B-55	Light Chain	Underground Contamination	None	Gravel/Soil Cover	2.0	Trace/Few Plants	None	0	24300
216-B-62	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Gravel/Soil Cover	2.0	Trace/Few Plants	None	0	20639
216-B-64	Chain Link Fence	Surface Contamination	None	None/Unknown	-8.0	None	Inside Tank Farm	125000	125000
241-ER-151	Chain Link Fence	Surface Contamination	None	None/Unknown	1.0	None	Inside Tank Farm	0	0
241-ER-311	Chain Link Fence	Surface Contamination	None	None/Unknown	0.0	None	Inside Tank Farm	0	0
UN-200-E-64	Light Chain	Surface Contamination	None	None/Unknown	0.0	Brush/Grass	None	0	0

Table 11-4. Inorganic and Organic Contaminants Identified at Sites Within Operable Unit 200-BP-9.

Site	Fluoride (kg)	FeCN (kg)	NH4NO3 (kg)	Potassium (kg)	Sodium (kg)	SulfAcid (kg)	Oxylate (kg)	Na Oxalate (kg)	NH4NO3 (kg)	Nitrite (kg)	Nitrate (kg)	Phosphate (kg)	Sulfamic Acid (kg)
216-B-12	0	0	1800000	0	0	0	0	0	1800000	0	0	0	0
216-B-55	0	0	90000	0	0	0	0	0	90000	0	0	0	0

Wells 299-E28-64, 299-E28-65, and 299-E28-66 are shallow monitoring structures that monitor sections 1, 2, and 3 of the crib. Radioactive contaminants have been detected in these wells and in the deeper well E28-16. Only background readings have been observed in well E28-9 (Fecht et al. 1977). The Hazardous Ranking System Facility Report dated April 21, 1986, however, states a tritium breakthrough to groundwater and surface water has occurred. The other radionuclides are retained in the soil column beneath the crib.

11.3 216-B-55 CRIB

The active 216-B-55 crib is a 750-ft-long waste disposal site located approximately 600 ft west of 221-B building (Hanford photograph A-37). The crib became operational in September 1967 (Maxfield 1979). It was designed to receive low-level liquid wastes (steam condensate) from the 221-B building. Radioisotopes present within the waste stream include: americium-241, cesium-137, plutonium-139, ruthenium-106, strontium-90, and tritium (Brown et al. 1990; Aldrich 1984). Well E28-12 monitors the 216-B-59 crib. Only background radioactivity was detected in the well September 1989. No change in activity was detected since last survey (Fecht et al. 1977).

11.4 216-B-62 CRIB

Located 1,500 ft northwest of the 221-B building, the active 216-B-62 crib has received low-level process condensate from the 221-B building separations facilities (Hanford photographs A-38 and A-39). Americium-241, cesium-137, ruthenium-106, strontium-90, tritium, and plutonium-239 are radionuclides present within the waste stream (Brown et al. 1990; Aldrich 1984).

Wells 299-E28-18, 299-E28-20, and 299-E28-21 monitor the 216-B-62 crib. Radionuclides were detected in the soil column beneath the head of the crib in well 299-E28-18. The radioactive contamination is contained high in the sediment column and breakthrough to groundwater has not occurred (Fecht et al. 1977).

BHI (1994) reports the total alpha decay (directly related to uranium-234 and uranium-238 concentration) in wells 299-E28-18 and 299-E28-22 to be decreasing as a trend. BHI (1994) data for well 299-E28-21 seems to be in direct conflict with the scintillation probe profile data (Fecht et al. 1977), which states that only background levels were detected. The concentrations of uranium-234 and uranium-238 in well 299-E28-18 exceed the concentration limits (RHO 1985; BHI 1994).

11.5 216-B-64 RETENTION BASIN

The inactive 216-B-64 retention basin located 250 ft west of the 221-B building was constructed but never used. Built in 1974, the purpose of the basin is to receive steam condensate from the 221-B building that exceeded release limits (Johnson 1980). The structure is surrounded by an 8-ft chain link fence with surface contamination warnings (Hanford photograph A-40) (site visit by authors, October 1991).

11.6 241-ER-151 DIVERSION BOX, 241-ER-311 CATCH TANK, AND UPR-200-E-84

The active 241-ER-151 diversion box and associated 241-ER-311 catch tank (see Section 8.10) are located 900 ft southwest of 221-B building and are not associated with any tank farm. They receive cross-site process and decontamination waste from diversion box 241-UX-154 via the 241-EW-151 vent station. Waste is also received from the 241-B, 241-BX, and 241-BY tank farms via the 244-BX double-contained receiver tank (BHI 1994).

UPR-200-E-84 occurred in March 1953 and is associated with the 241-ER-311 catch tank. The catch tank leaked about 6,500 L of acid contaminated with approximately 10 Ci of fission products to the ground (Stenner et al. 1988). At the time of release, no ground surface contamination was detected (Historical Unplanned Release File [draft]). This is a low activity site (Harmon et al. 1975). Historical records do not indicate whether the tank was repaired or if the tank "leak" was caused by overfilling. There is no mention of any cleanup of the site.

11.7 UN-200-E-64 UNPLANNED RELEASE

The area west of the 216-B-64 retention basin is restricted by a light-weight chain barricade and surface contamination warnings. Ants burrowing into soil contaminated by leakage from the 270-E-1 condensate neutralization tank, transported contaminated material to the surface. The site was established on October 12, 1984, and consists predominately of cesium-137 and strontium-90. No cleanup action has been taken (Cramer 1987). A series of barricades to the south indicates probable contaminant migration.

12.0 OPERABLE UNIT 200-BP-10

There are six inactive burial grounds and three UPRs in Operable Unit 200-BP-10. It is located in the northwestern corner of the 200 East Area (Figures 1-1 and 12-1). The active 218-E-10 burial ground, which is not part of Ecology et al. (1991), or part of this study, covers the majority of Operable Unit 200-BP-10 surface area (Hanford photograph A-41). Burial ground 218-E-10 also constitutes the largest source of contamination within the operable unit.

Burial ground 218-E-5A contains both TRU and mixed waste, while all the other burial grounds contain only mixed waste. None of the sites included in this operable unit scored greater than 1 on the PNL migration hazard system (Table 12-1).

A graphical summary of the operational history of these sites is depicted in Figure 12-2, and specific operating dates are listed in Table 12-2. Table 12-3 provides a summary of current site conditions based on several site visits performed by the authors during September 1991. There were no organic and inorganic contaminants identified in BHI (1994) associated with the sites of this operable unit.

12.1 218-E-2, 218-E-2A, 218-E-4, 218-E-5, 218-E-5A, AND 218-E-9 BURIAL GROUNDS

Several inactive solid waste burial grounds are located in and around the B Plant railroad spur directly north of B Plant (Hanford photograph A-42). See Figure 11.1 for the approximate layout of the site. The waste consists mainly of failed equipment and industrial wastes packaged in boxes that were transported to the site via rail car then buried underground in trenches. The north end of the 218-E-5 trenches contains railroad boxcars contaminated with uranyl-nitrate-hexhydrate. The area was also used as an aboveground storage site for contaminated equipment in some cases (Stenner et al. 1988).

An inspection on February 21, 1978, disclosed some degree of subsidence associated with each trench, and ground surface contamination on a number of tumbleweeds near the north end of the 218-E-9 burial ground. Subsidence features of the various trenches plus vegetation growth patterns show the true location of the burial trenches in burial grounds 218-E-2, 218-E-5, and 218-E-9 to be different than those drawn on Hanford drawing H-2-55534 (Mirabella 1977). Extensive research was done in 1979 to determine the location of all burial trenches within the bounds of 218-E-2, 218-E-5, 218-E-5A and 218-E-9 burial ground radiation zone. The work included viewing aerial photographs and construction prints, analyzing plant growth patterns, and load testing the ground surface with a 40-ton vehicle. As a direct result of the research, four new previously unrecorded trenches within the sites were identified (Maxfield 1979; BHI 1994).

The entire site has been stabilized (Stenner et al. 1988). Burial grounds 218-E-2, 218-E-5, 218-E-5A, and 218-E-9 were stabilized together as one large field (Hanford photographs A-43 and A-44). Burial grounds 218-E-2A (Hanford photograph A-45) and 218-E-4 (Hanford photograph A-46) were stabilized independently. Contaminated equipment previously stored aboveground in these burial grounds was removed and transported to trench 218-E-10 for further storage or burial. A minimum 1-ft layer of soil/sand depth was distributed over the trenches.

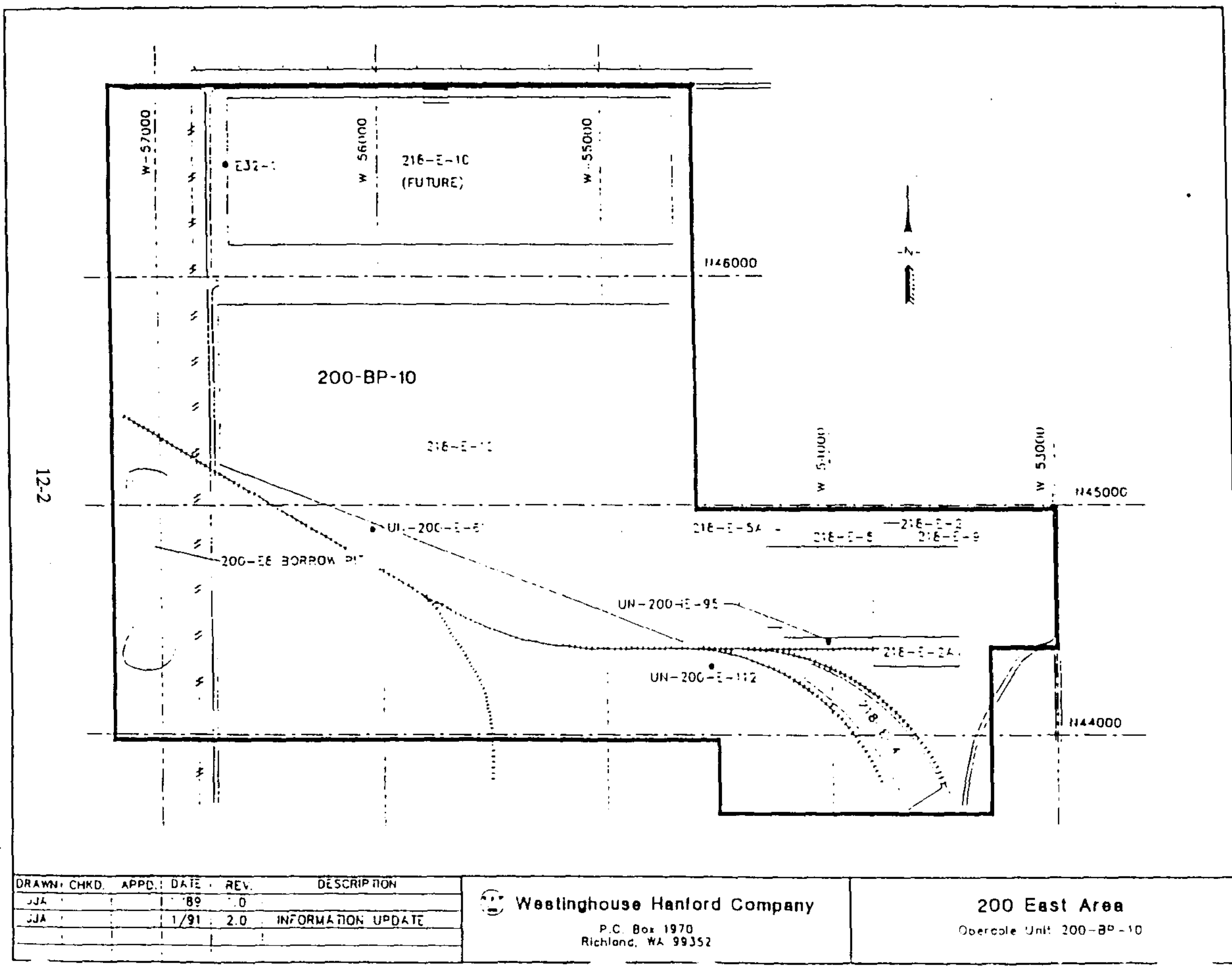


Figure 12-1. Location Map for Operable Unit 200-BP-10.

Table 12-1. Site Location and Waste Type Summary Table for Operable Unit 200-BP-10.

Site	Type of Site	Status	Coordinates	Type of Waste
218-E-2	Burial Ground	Inactive	N44827 W53425, N44826 W53909, N44407 W53426, N44408 W53911	Mixed Waste
218-E-2A	Burial Ground	Inactive	N44300 W53800, N44300 W53450, N44250 W53800, N44250 W53450	Mixed Waste
218-E-4	Burial Ground	Inactive	N43783 W53503, N43685 W53677, N44241 W54142, N44313 W54110	Mixed Waste
218-E-5	Burial Ground	Inactive	N44826 W54209, N44408 W53911, N44407 W54165, N44826 W53909	Mixed Waste
218-E-5A	Burial Ground	Inactive	N44827 W54309, N44495 W54164, N44494 W54309, N44826 W54209	TRU/Mixed Waste
218-E-9	Burial Ground	Inactive	N44827 W53400, N44400 W53400, N44827 W53500, N44400 W53500	Mixed Waste
UN-200-E-112	Unplanned Release	Inactive	N44300 W54550	Mixed Waste
UN-200-E-61	Unplanned Release	Inactive	N44875 W56075	Mixed Waste
UN-200-E-95	Unplanned Release	Inactive	N44425 W53400 to W54100	Mixed Waste

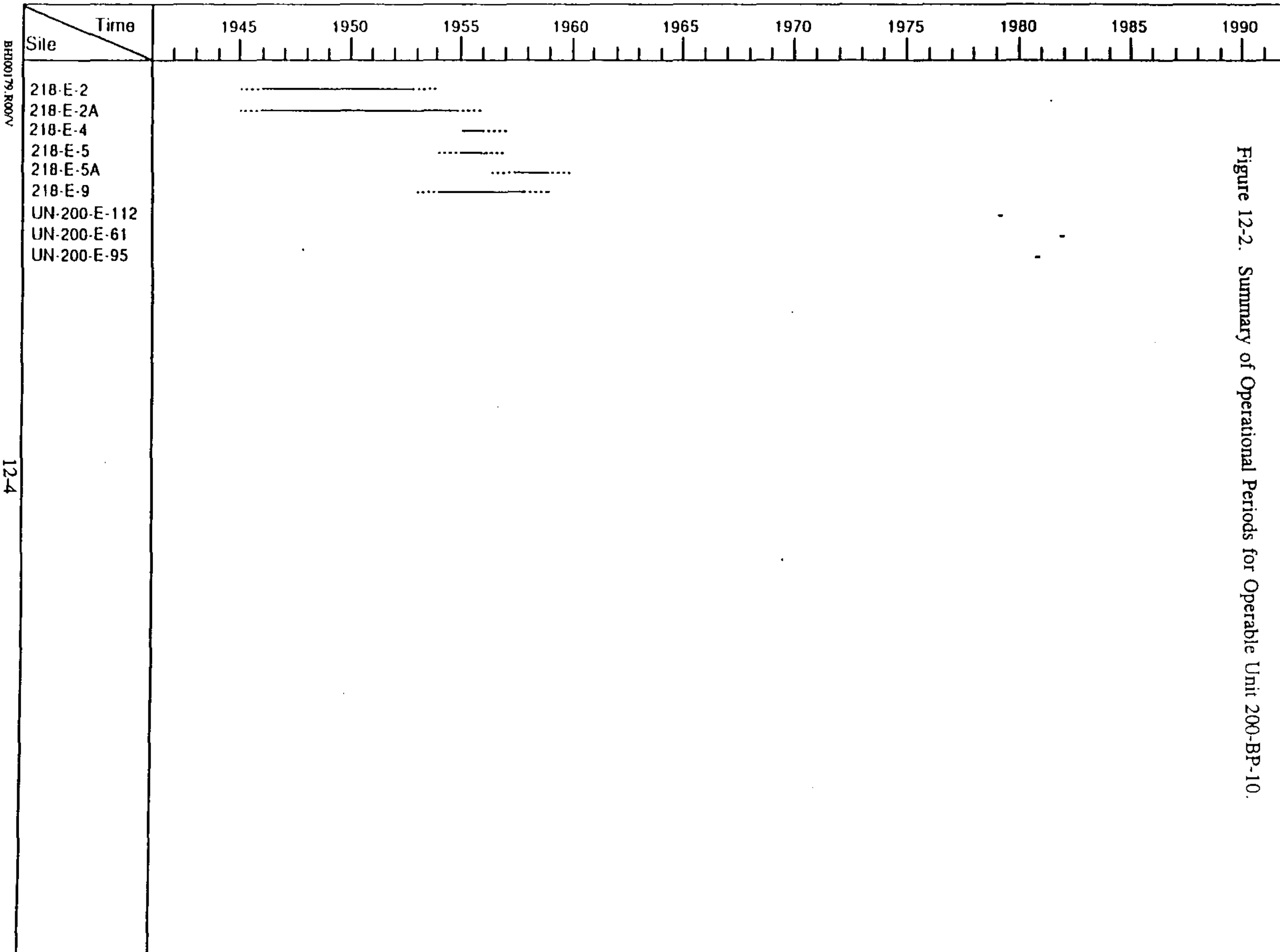


Figure 12-2. Summary of Operational Periods for Operable Unit 200-BP-10.

BHI00179.R00/V

Table 12-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-BP-10.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-E-2	Solid	1945	1953		Top	541	441	15	11507	9033	0.65	
218-E-2A	Solid	1945	1955		Bot	350	25	15	2903	0	0.00	
218-E-4	Solid	February 1955	1956		Top	780	200	15	5920	1586	0.65	
216-E-5	Solid	1954	1956		Top	340	131	15	16747	3172	0.65	
218-E-5A	Solid	1956	1959		Top	120	100	15	2200	6173	0.65	
218-E-9	Solid	1953	1958		Top	427	100	5	11832	0	0.00	
UN-200-E-112	Solid			February 12, 1975	Top	0	0	0	0	0	0.82	
UN-200-E-61	Liquid			October 31, 1981	Top	0	0	0	0	0	0.00	
UN-200-E-95	Solid			September 1980	Top	0	0	0	0	0	0.73	

Table 12-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-10.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad. Zone (sq ft)
216-E-2	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Cattails/Brush/Grass	None	0	7875
216-E-2A	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Cattails/Brush/Grass	None	0	19920
216-E-4	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Cattails/Brush/Grass	None	0	150640
216-E-5	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	2.0	Cattails/Brush/Grass	None	0	7875
216-E-5A	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Soil cover/backfill	2.0	Cattails/Brush/Grass	None	0	7875
216-E-5	Light Chain	Underground Contamination	Concrete Post w/ Plaque	Soil cover/backfill	2.0	Cattails/Brush/Grass	None	0	7875
UN-200-E-112	Remesh Fence	Radiation Control Area	None	None/Unknown	0.0	None	None	0	0
UN-200-E-61	None	Could not determine	Could not determine	None/Unknown	0.0	Brush/Grass	None	0	0
UN-200-E-95	Light Chain	Could not determine	Could not determine	None/Unknown	0.0	None	None	0	0

The soil was fertilized and a mixture of perennial grasses planted in October and November 1980 (Winterhalder 1981; BHI 1994). The re-vegetation effort was seriously hampered by less than ideal planting dates in late fall. However, a recent site visit by the authors confirms that the site is heavily vegetated (site visit by authors, October 1991).

12.2 UN-200-E-61 UNPLANNED RELEASE

Three UPRs are associated with the railroad tracks adjacent to the 200 East Area burial grounds. On October 31, 1981, the railroad right-of-way near the 200 East industrial burial grounds was declared the site of a UPR after the unloading ramp was identified as being an unknown beta/gamma source that generated readings up to 100,000 c/m. Radioactive contamination to the ground resulted from the railroad burial car operations (Cramer 1987), presumably over time.

The burial ground right-of-way was decontaminated to background radiation levels. There is no potential for further release from the spill site, only background levels of radiation remain (Cramer 1987). Due to light chain barricades, the authors could not gain access for inspection during site visit.

12.3 UN-200-E-95 UNPLANNED RELEASE

The railroad spur between 218-E-2A and 218-E-5 burial grounds was used as an aboveground storage zone for low-level contaminated equipment. Equipment from B Plant and PUREX Plant operations for were stored, for the most part, in boxes on the beds of railroad flat cars (Maxfield 1981). The storage zone is still active and the casks on the rail car shown in site photographs contained in Appendix A are still present (site visit by authors, October 1991).

UPR UN-200-E-95 is associated with this storage area. The actual date of this UPR is unknown. Authors believe the contamination is possibly the result of the accumulation of many small "releases" over time. The area was established as a site in September 1980 (Maxfield 1981). Presently, there is general site contamination of 200 to 400 c/m with spot contamination of 4,000 c/m, which represents a significant decrease in activity from the 1989 survey. This is due in part to decontamination efforts (BHI 1994). A Health Physic's Scheduled Radiation Survey Report dated September 20, 1991, reported an average background reading of 2,000 c/m (beta) and a general rail contamination reading between 3,000 (beta) and 6,000 c/m (beta) with a maximum of 350,000 dis/min (beta) at one spot. Alpha contamination was below instrumentation limits. The area is barricaded by a steel chain and posted with surface contamination warnings (site visit by authors, October 1991).

12.4 UN-200-E-112 UNPLANNED RELEASE

UPR UN-200-E-112 occurred on February 12, 1979, during a routine 221-B canyon equipment burial. Some contaminated liquid spilled out of an ion-exchange column that was being loaded into a burial box atop a rail car. The liquid spilled into the B Plant railroad tunnel and was carried out by one wheel of the railroad car, contaminating the track from B Plant to the east boundary of the burial ground. The contamination was found immediately and cleaned up by noon the same day (Stenner et al. 1988).

13.0 OPERABLE UNIT 200-BP-11

Operable Unit 200-BP-11 is the largest operable unit of the B Plant Aggregate Area. It is located outside the perimeter fence and east of the 200 East Area in the 600 Area (Figures 1-1 and 13-1). The most prominent sites within this operable unit are the series of "B Ponds." Four of these ponds are active and one, contingency pond 216-E-25, is inactive (Table 13-1). Three ditches and four UPRs constitute the remainder of the sites within this operable unit. These sites have not been evaluated on the basis of the PNL migration hazard ranking system (Stenner et al. 1988; Table 13-2).

Sites within this operable unit have been active since April 1945. Figure 13-2 provides a graphical summary and Table 13-2 lists specific dates for the operational history of individual sites in 200-BP-11. Table 13-3 provides a summary of current site conditions based on several site visits performed by the authors between September and November 1991.

13.1 216-B-3 POND, UPR-200-E-34, UPR-200-E-51, AND UPR-200-E-138

This pond is about 3,500 ft east of the 200 East Area perimeter fence and about 5,000 ft northeast of the 202-A building (Figure 2-1). It is an active site and has been since April 1945 (Maxfield 1979). It is roughly rectangular, and covers about 40 acres (WHC 1987) (Maxfield 1979). The site has received mixed waste via the 216-A-29, 216-B-3-1, 216-B-3-2, and 216-B-3-3 ditches (Cramer 1987). The east end of the pond is formed by a dike 1,380 ft long and 35 ft high. It extends about 5 ft above the water level. The pond unit has been sealed with bentonite to reduce infiltration (Smyth 1987).

Waste streams include: steam condensate and process cooling water from the 221-B building, 284-E powerhouse water, the 244-AR and 244-CR vaults cooling water, 242-A evaporator, 202-A process, and air-sampling vacuum pumps seal cooling water, chemical sewer and acid fractionator condensate, 241-BY tank farm condenser cooling water, and Waste Encapsulation Storage Facility cooling water (Cramer 1987). The Waste Stream Characterization Report (WHC 1989) provides a comprehensive list of compounds discharged to this and many other 200 Area sites.

There are three known UPRs associated with this pond; UPR-200-E-34, UPR-200-E-51, and UPR-200-E-138. In June 1964, there was a coil leak from the F-15 PUREX tank (UPR-200-E-34) that contaminated the 216-B-3 pond with mixed fission products. Measurements of 10,000 Ci were observed at the point of the leak (Stenner et al. 1988). Remedial action was taken to kill the algae and precipitate the fission products. The inlet ditches were covered with soil. UPR-200-E-51 occurred in May 1977 when 15 kg of cadmium nitrate was released from PUREX tank TK-324 to the 216-B-3 pond and the 216-B-3-3 ditch (Stenner et al. 1988). A third UPR, UPR-200-E-138, occurred when a leaking manometer sensing line emitted 1,000 Ci of strontium-90 in March 1970. This UPR contaminated the 216-B-3 pond, and is also briefly discussed in Section 10.2. Stenner et al. (1988) do not mention any cleanup effort at the pond following this release.

Water samples in the pond reached a maximum strontium concentration of 1.7 by 10^{-3} $\mu Ci/m^3$ (Smith 1970).

Figure 13-1. Location Map for Operable Units 200-PO-5 and 200-BP-11.

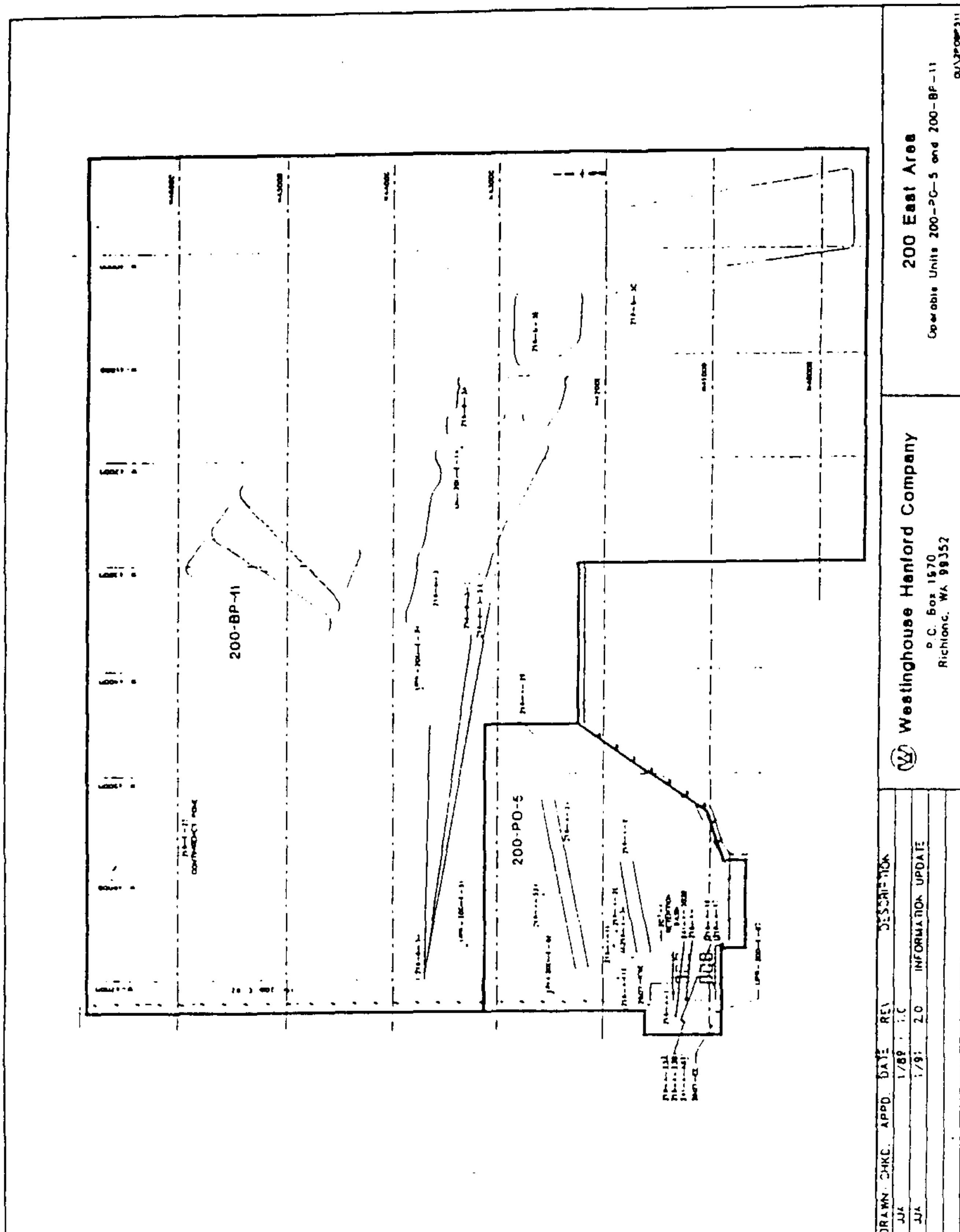


Table 13-1. Site Location and Waste Type Summary for Operable Unit 200-BP-11.

Site	Type of Site	Status	Coordinates	Type of Waste
216-B-3	Pond	Active	N43600 W44370, N42850 W39950, N41000 W39350, N41000 W40500	Mixed Waste
216-B-3-1	Ditch	Inactive	N43700 W47000 (head), N43645 W45760 (end)	Mixed Waste
216-B-3-2	Ditch	Inactive	N43700 W47000 (head), N43250 W43650 (end)	Mixed Waste
216-B-3-3	Ditch	Active	N43700 W47000 (head), N43075 W43350 (end)	Low-Level Waste
216-B-3A	Pond	Active	N43600 W41850, N43550 W41500, N42500 W41500, N42550 W41950	Mixed Waste
216-B-3B	Pond	Active	N42950 W41400, N42950 W40750, N42250 W40800, N42250 W41200	Mixed Waste
216-B-3C	Pond	Active	N42000 W40500, N42000 W41025, N41000 W40750, N41000 W40500	Mixed Waste
216-E-25	Pond	Inactive	N45950 W45820	Low-Level Waste
UN-200-E-14	Unplanned Release	Inactive	N43375 W41675	Mixed Waste
UN-200-E-92	Unplanned Release	Inactive	N43850 to N46800 W47250	Mixed Waste
UPR-200-E-34	Unplanned Release	Inactive	N43725 W44200	Mixed Waste
UPR-200-E-51	Unplanned Release	Inactive	N43300 W46700	Mixed Waste

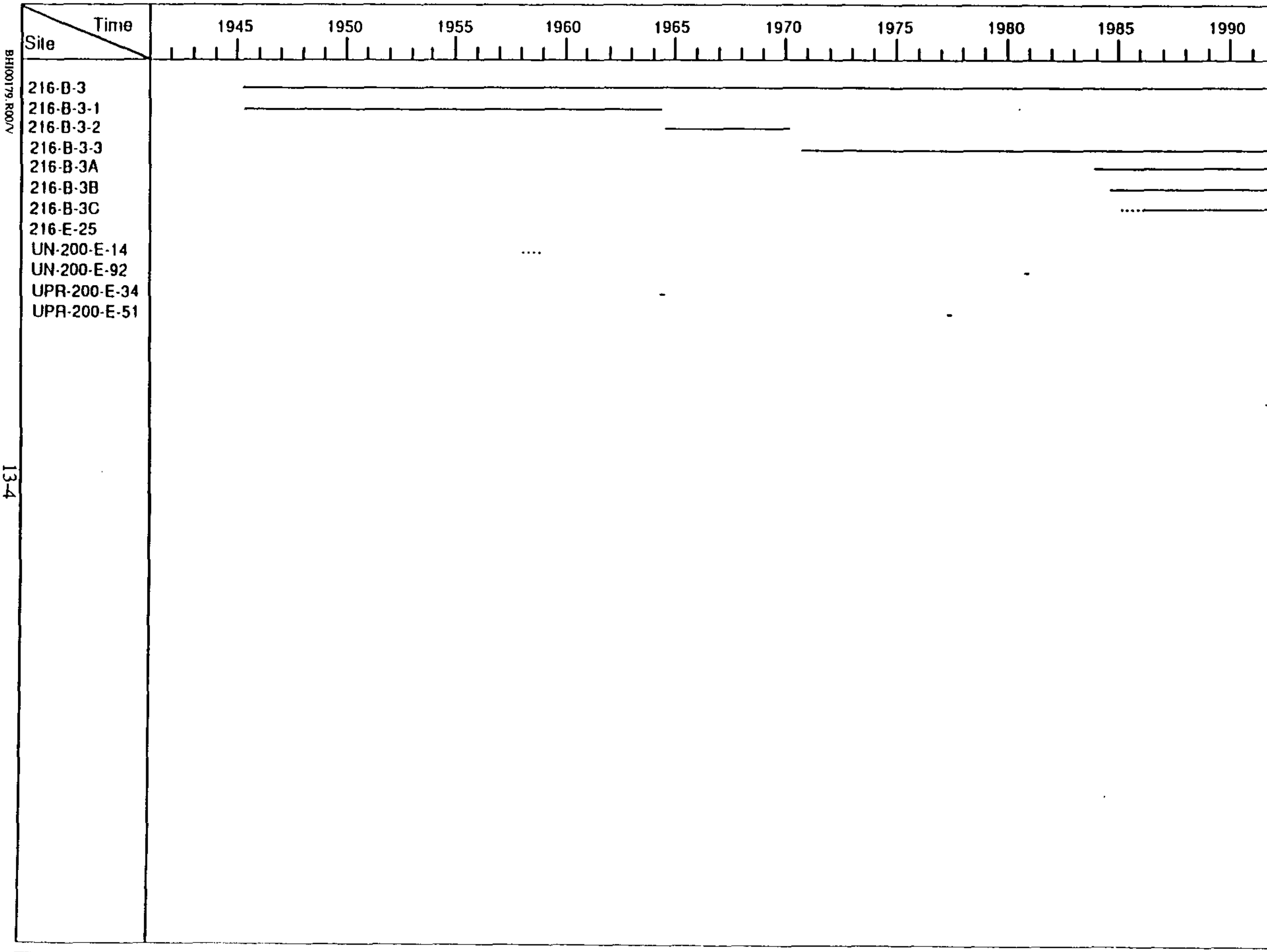


Figure 13-2. Summary of Operational Periods for Operable Unit 200-BP-11.

Table 13-2. Operational Dates and Status, Site Dimensions, and Waste Volumes summary Table for Operable Unit 200-BP-11.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-B-3	Liquid	April 1945	Active		Top	0	0	0	63000	240000000000	0.00	UPR-200-E-34,51,138
216-B-3-1	Liquid	April 1945	July 1964		Top	3200	6	6	3700	149000000000	0.00	UPR-200-E-34
216-B-3-2	Liquid	July 1964	September 1970		Top	3700	15	0	0	149000000000	0.00	
216-B-3-3	Liquid	September 30, 1970	Active		Top	0	3700	0	0	0	0.00	UPR-200-E-51
216-B-3A	Liquid	October 1983	Active		Top	0	0	0	0	0	0.00	
216-B-3B	Liquid	June 1984	Active		Top	0	0	0	0	0	0.00	
216-B-3C	Liquid	1985	Active		Top	0	0	0	0	0	0.00	
216-E-25	Liquid	Unknown	Unknown		Top	0	0	0	0	0	0.00	
UN-200-E-14	Liquid			1958	Top	0	0	0	0	0	0.00	
UN-200-E-92	Solid			September 1980	Top	0	0	0	0	0	0.00	
UPR-200-E-34	Liquid			June 12, 1964	Top	0	0	0	0	0	0.00	
UPR-200-E-51	Liquid			May 18, 1977	Top	0	0	0	0	0	0.00	

Table 13-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-BP-11.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con. (sq ft)	Rad Zone (sq ft)
216-B-3	Light Chain	Surface Contamination	None	None/Unknown	0.0	None	None	0	0
216-B-3-1	Light Chain	Underground Contamination	None	Soil cover/Backfill	0.5	Brush/Grass	None	0	200000
216-B-3-2	Light Chain	Underground Contamination	None	Soil cover/Backfill	0.5	Brush/Grass	None	0	200000
216-B-3-3	Light Chain	Surface Contamination	Concrete Post w/ Plaque	None/Unknown	0.0	None	None	0	0
216-B-3A	Light Chain	Surface Contamination	None	None/Unknown	0.0	None	None	0	0
216-B-3B	Light Chain	Surface Contamination	None	None/Unknown	0.0	None	None	0	0
216-B-3C	Light Chain	Surface Contamination	None	None/Unknown	0.0	None	None	0	0
216-E-25	Light Chain	Surface Contamination	Concrete Post w/ Plaque	Soil cover/Backfill	0.0	Non-native Grass	None	0	0
UN-200-E-14	Light Chain	Surface Contamination	None	None/Unknown	0.0	None	None	0	528
UN-200-E-92	None	None	None	None/Unknown	0.0	Brush/Grass	None	0	0

In 1970, bulldozers were used to push dirt over the north, south, and west shorelines of the 216-B-3 pond. The pond shoreline radioactivity was reduced from a maximum of 650 mR/h to 10 mR/h at the ditch inlet. Measurements elsewhere around the pond range from 1,000 c/m to 25,000 c/m. Much of the shoreline radioactivity has come from the deposition and accumulation of wind blown radioactive debris on the shoreline, such as Russian thistle fragments (Hanford photograph A-47). During this same time period, the coot population on the pond was reduced from about 100 to 15 coots. This was done both through the use of six gas-operated cannons (the noise drives the waterfowl away) and by removal of individual foul (Maxfield 1970).

Water samples are collected monthly, while sediment and vegetation samples are collected annually. No contamination was detected in the survey plots in the 1990 survey (Environmental Protection hardfiles).

13.2 216-B-3A POND

The 216-B-3A and 216-B-3B ponds, or lobes as they are more often known, were built to handle increased discharge resulting from the restart of PUREX operations. The 216-B-3A pond was operational between October 1983 to January 1984. In January 1984 the dike separating the A and B ponds was breached at the dike spillway and site use was halted. The ponds were reopened for use after the dike was repaired (Wilczek, personal communication; site visit by authors, 1991).

The 216-B-3A pond is an active site covering about 10 acres (WHC 1987) and appears to be shallow, about 2 to 3 ft deep (Hanford photograph A-48). It receives water from the 216-B-3 pond via the 216-B-352 overflow structure (site visit by author, October 1991). The surface elevation of this pond is approximately 18 ft lower than the 216-B-3 pond. It has two outflow structures at its eastern end. One of these structures can release water to the 216-B-3B pond and one can release water to the 216-B-3C pond (site visit by author, October 1991).

The pond has a very low infiltration rate, possibly due to siltation, algae growth, and migration of bentonite from 216-B-3 (WHC 1987).

13.3 216-B-3B POND

This pond was in service from June 1984 until May 1985 (Wilczek, personal communication). It received water from the higher elevation 216-B-3B pond. The pond is roughly rectangular and is currently dry. It has been unused since it was dredged in 1986 (WHC 1987). Up to 7 ft of material was removed in the dredging process, it was dredged to a level equal to the bottom of the channels in the bottom of the pond. The removed material was placed along the north shore of the 216-B-3 pond (Wilczek, personal communication). It is still listed as an active site in BHI (1994).

There is a light chain barricade around the entire pond and it has "Danger" warning signs. Within the barricade, there is a second light chain barricade surrounding the inlet ditch. It is posted with surface radiation contamination warning signs (site visit by author, October 1991).

13.4 216-B-3C POND

This pond has been active since its construction in 1985 (WHC 1987). It was built to handle increased discharge to the 216-B-3 pond system arising from the decommissioning of the Gable Mountain Pond (Wilczek, personal communication). It was excavated in a coarse gravel layer to increase the infiltration rate (WHC 1987). Within the roughly rectangular depression of the pond, there are a series of distribution channels running the length of the pond bottom. This is the lowest elevation pond in the 216-B-3 pond series (site visit by authors, 1991). Virtually all of the 216-B-3 pond system's flow is disposed in this pond (WHC 1987).

13.5 216-B-3-1 DITCH

This ditch was in service from April 1945 to July 1964 (Stenner et al. 1988). It carried mixed waste (Maxfield 1979) from the 216-B-2-1 ditch to the 216-B-3 pond, although much of the waste infiltrated through the ditch bottom (Stenner et al. 1988). The head of the ditch is about 3,000 ft northeast of the 221-B building (Harmon et al. 1975). UPR-200-E-34 affected this site and is discussed with the 216-B-3 pond.

Waste streams include: 221-B building steam condensate, process cooling water and chemical sewer waste; 284-E powerhouse water; 241-CR vault cooling water; 242-A evaporator cooling water; 202-A process waste; condenser condensate; air sampling vacuum pump seal cooling water, and chemical sewer and acid fractionator condensate; and 241-BY tank farm condenser cooling water (Stenner et al. 1988).

The unit was backfilled in 1964. In 1971, 10-mil plastic sheets were placed over a new 4-in. layer of sand. The sheets were overlapped 2 ft to provide an effective root barrier. The sheeting was then covered with 18 in. of sand and topped with 4 in. of gravel to prevent erosion by the wind (Hanford photograph A-49). The entire ditch was treated in this fashion, except for the 100 ft nearest the head of the ditch located at the western boundary of operable unit 200-BP-11. At the eastern end of the ditch, the treated area is about 100 ft wide. This is where the 216-A-29 ditch had intersected this ditch. This area experienced swampy conditions when both ditches were operational. The plastic barrier has been effective in limiting radioactive contaminated weed growth (Maxfield 1979).

Prior to the 1971 stabilization, Russian thistle was growing profusely over areas of the covered ditch. Radiation measurements of up to 40 mR/h were observed on surfaces of the thistle. During a routine surveillance in 1984, contamination was found as follows: spotty contamination of soil up to 50,000 c/m, vegetation up to 100,000 c/m, coyote feces up to 2,000 c/m, and animal burrows up to 12,000 c/m (BHI 1994).

The area is currently on a semiannual environmental surveillance schedule. There is a 20 ft by 100 ft area containing weeds that are contaminated up to 5,000 c/m. This is an increase from the 1989 survey. Plans have been made to remove the tumbleweeds and to increase the herbicide spray (Environmental Protection hardfiles).

13.6 216-B-3-2 DITCH

This ditch is located south of, and replaced, the 216-B-3-1 ditch. Operational use of this ditch began in July 1964 and was terminated in September 197 after it became contaminated with strontium-90 (UPR-200-E-138) in March 1970 (Maxfield 1979). Maximum dose rates at the head of the ditch, following the UPR measured 450 mR/h. The ditch was backfilled following the UPR (BHI 1994).

The ditch carried the following waste to the B Ponds: 221-B building steam condensate and process cooling water; 284-E powerhouse water; 241-CR vault cooling water; 242-A evaporator cooling water; 202-A process waste; condenser water; air sampling vacuum pumps seal cooling water; chemical sewer waste; acid fractionator condensate; 241-BY tank farm condenser cooling water; and Waste Encapsulation Storage Facility cooling water (Stenner et al. 1988).

The area is currently on a semiannual environmental surveillance schedule. There is a 20-ft by 100-ft area containing weeds that are contaminated up to 5,000 c/m. Plans have been made to remove the tumbleweeds and to increase the herbicide spray. The site has been stabilized in the same manner as the 216-B-3-1 ditch (Hanford photograph A-50) (BHI 1994; site visit by authors, October 1991).

13.7 216-B-3-3 DITCH

Placed in service at the end of September 1970, this is the active ditch that feeds the 216-B-3 pond (Maxfield 1979). It trends south of, and sub-parallel to the ditches that it replaced (site visit by authors, October 1991) (Hanford photograph A-51). The site is on an annual radiological survey schedule. Water samples are collected weekly, and sediment and vegetation are sampled annually (Wheeler 1988). The only contamination found on the most recent radiological survey was on plot number 15; it measured 4,000 dis/min, which is unchanged from the 1989 survey (Environmental Protection hardfiles). There was a UPR of cadmium nitrate through this ditch (UPR-200-E-51), which is discussed under the 216-B-3 pond heading.

13.8 216-E-28 POND

This pond is listed as an inactive site (BHI 1994). The site could not be located during a site visit and in Figure 13.1 it is listed only as a "contingency pond." Authors were not able to locate drawings or photographs of the site.

13.9 UN-200-E-14

In 1958 the B-3 pond dike broke allowing the contaminated water to flow down a ravine east of the pond. The contaminated zone was covered with clean soil. Isotope and curie content information was not contained within BHI (1994). The area was released from radiation zone status in December 1970 (Stenner et al. 1988).

13.10 UN-200-E-92

This site is the result of contaminated Russian thistle being blown from their growth sites in some of the 200 East Area waste sites and lodging against the east perimeter fence. Over a number of years, the thistles have decomposed and released small amounts of strontium and cesium radioactivity into the wind blown sand along the bottom of the fence. During the spring of 1981, the contaminated sand was removed from the bottom of the fence and buried in the excavation pit north of 216-A-24 crib (Maxfield 1981). The site has been released from radiation zone status (Stenner et al. 1988).

13.11 UNNUMBERED AREA

An area approximately 70 ft wide and 100 ft long delimited with a light-weight chain barricade with surface contamination warning signs was observed outside the 200 East security area. It is located along Canton Avenue about 65 ft south of 12th Street in Operable Unit 200-BP-11. It is believed the site resulted from wind blown soil and pieces of contaminated vegetation. No number has been assigned to the site and cleanup actions have not been defined (Environmental Protection, personal communication, 1991; site visit by authors, 1991).

14.0 OPERABLE UNIT 200-SS-1

The 200-SS-1 Operable Unit comprises most of the southwest quarter of the 200 East Area (Figures 1-1 and 14-1). The majority of the 200 East Area septic tanks and the 200 East power plant are located within this operable unit. Note that Figure 14-1 has been modified to accurately reflect septic tank locations in this operable unit. This is the only operable unit within the B Plant Aggregate Area where numerous discrepancies between reported and actual locations of sites was encountered.

There are a total of 20 sites, including 14 septic tank sites, and only two of the sites are inactive. The two inactive sites contain mixed waste, while all the active sites contain either hazardous, or nonhazardous nonradioactive waste (Table 14-1) (BHI 1994). Figure 14-2 summarized the operational history of each site. Table 14-2 provides operational data, dimensions, and waste volumes for each site. Table 14-3 provides a summary of current site conditions based on several site visits performed by the authors during the September through November 1991 time frame. There were no organic or inorganic contaminants identified in BHI (1994) associated with the sites of this operable unit.

14.1 200-E POWERHOUSE ASH PIT

This active site is located about 200 ft south of 4th Street across from the entrance to the Dry Materials Receiving and Handling Facility (Figure 14-1). The ash pit receives ash from the 200 East Area powerhouse at a rate of about 9,480 yd^3/yr. The pit became active in 1943 and currently contains about 81,000 yd^3 of ash. The ash has been analyzed for EP Toxicity and no hazardous materials were found (Cramer 1987).

14.2 218-E-3 BURIAL GROUND

Burial ground 218 E-3 was located in the extreme southwestern corner of the 200-SS-1 Operable Unit (Figure 14-1) and was only active in 1954 (Stenner et al. 1988) (Hanford photograph A-52). The burial ground received construction scrap including metal slip forms, barrels, and timbers from the 202-A construction work that had been contaminated with ruthenium-106 released from the REDOX stack. In 1971, the pit was uncovered. Surveys found that no measurable alpha, beta, or gamma activity remained in the soil or on the equipment (Maxfield 1971). The site was exhumed and removed from radiation zone status (Stenner et al. 1988). The date of exhumation could not be determined.

14.3 2607-E1 SEPTIC TANK

This active septic tank and associated drain field entered operation in 1970 (Cramer 1987). The tank is located about 200 ft northeast of the intersection of Baltimore Avenue and 4th Street and the drain field is north of the tank (Hanford drawing H-2-44500, Sheet 3). The tank is constructed of reinforced concrete with 10-in. walls and floor and dimensions of 25 ft by 10.5 ft by 13 ft deep. It is designed to serve 400 people with an average retention period of 24 h (BHI 1994).

Figure 14-1. Location Map for Operable Unit 200-SS-1.

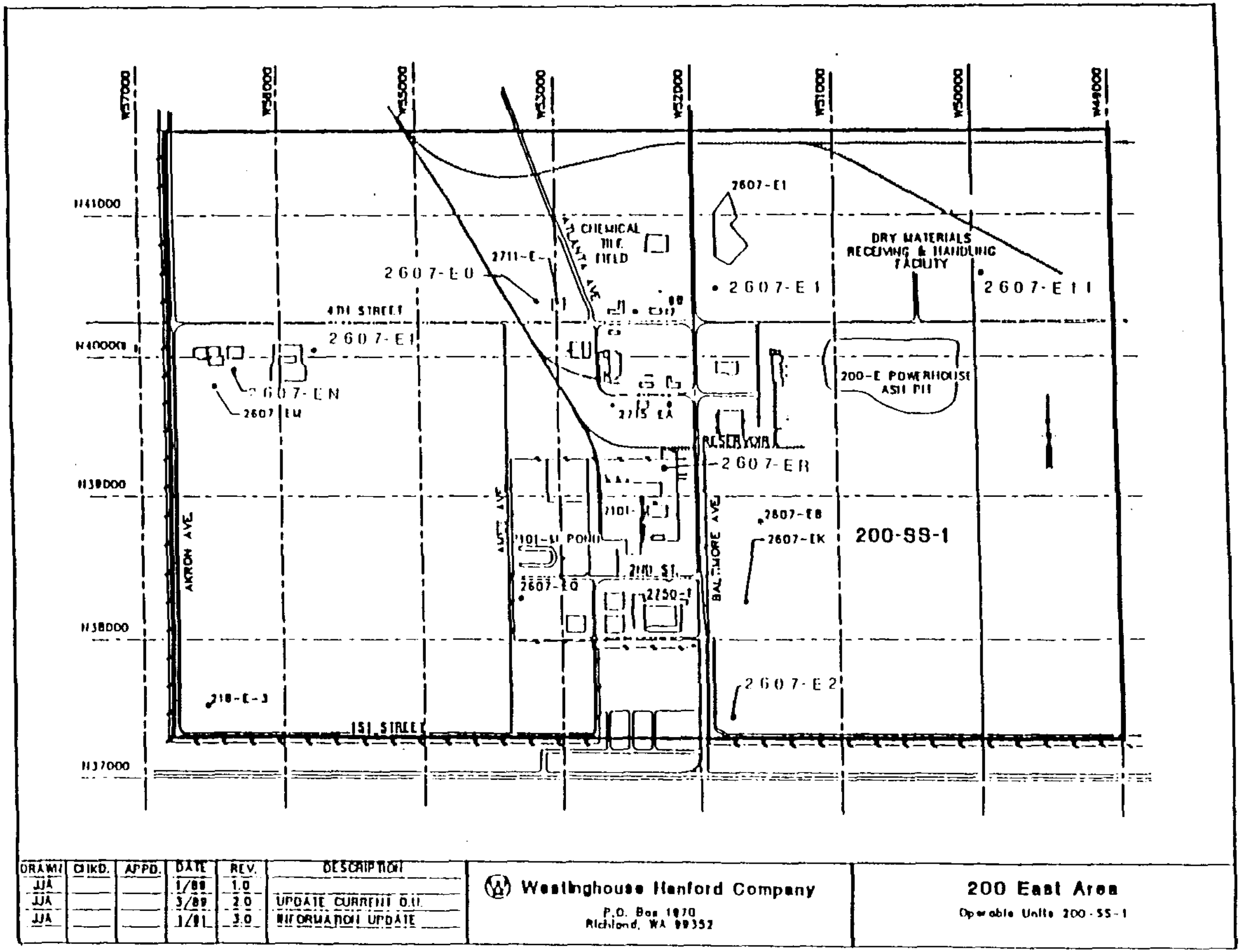


Table 14-1. Site Location and Waste Type Summary Table for Operable Unit 200-SS-1.

Site	Type of Site	Status	Coordinates	Type of Waste
200-E PAP	Ash Pit	Active	N40000 W51500	Nonhazardous/Nonradioactive
218-E-3	Burial Ground	Inactive	N37525 W56550	Mixed Waste
2607-ED	Septic Tank	Active	N40400 W54200	Nonhazardous/Nonradioactive
2607-EI	Septic Tank	Active	N40400 W54200	Nonhazardous/Nonradioactive
2607-EII	Septic Tank	Active	N40000 W51000	Nonhazardous/Nonradioactive
2607-E2	Septic Tank	Active	N37500 W52900	Nonhazardous/Nonradioactive
2607-E7B	Septic Tank	Active	N40275 W53150	Nonhazardous/Nonradioactive
2607-E8	Septic Tank	Active	N38800 W52550	Nonhazardous/Nonradioactive
2607-EH	Septic Tank	Active	N39050 W53250	Nonhazardous/Nonradioactive
2607-EK	Septic Tank	Active	N38500 W52700	Nonhazardous/Nonradioactive
2607-EM	Septic Tank	Active	N40000 W56500	Nonhazardous/Nonradioactive
2607-EN	Septic Tank	Active	N39900 W56400	Nonhazardous/Nonradioactive
2607-EP	Septic Tank	Active	N40000 W55800	Nonhazardous/Nonradioactive
2607-EQ	Septic Tank	Active	N38300 W54300	Nonhazardous/Nonradioactive
2607-ER	Septic Tank	Active	N39775 W56400	Nonhazardous/Nonradioactive
2607-GF	Septic Tank	Active	N41000 W51150	Nonhazardous/Nonradioactive
2703-E HWSA	Staging Area	Active	N40300 W53200	Hazardous Waste
2704-E HWSA	Staging Area	Active	N40300 W53600	Hazardous Waste
2715-EA HWSA	Staging Area	Active	N39550 W53120	Hazardous Waste
CTFN 2703-E	Drain Field	Inactive	N40800 W53250	Mixed Waste

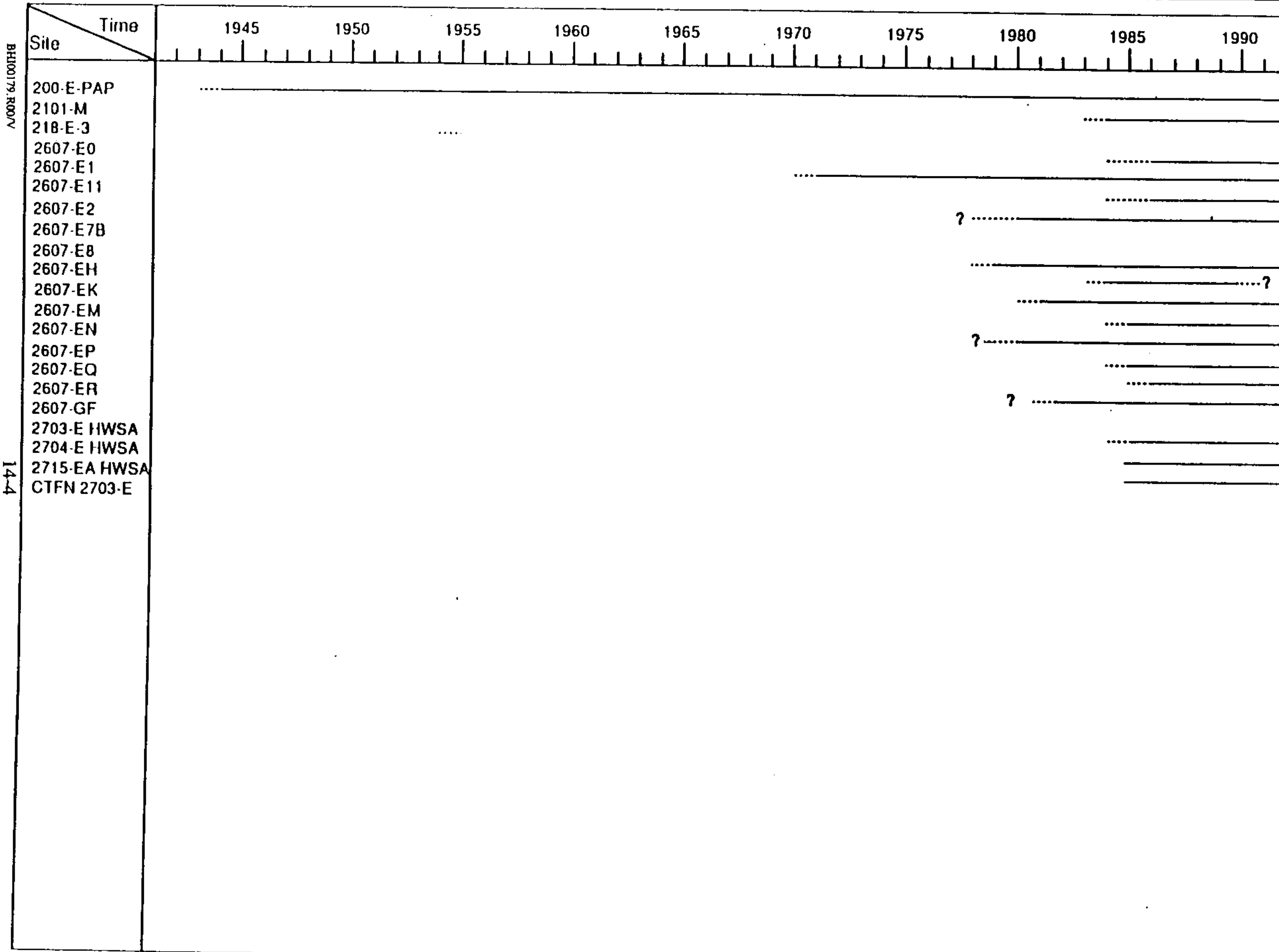


Figure 14-2. Summary of Operational Periods for Operable Unit 200-SS-1.

Table 14-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-SS-1.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo. Depth (ft)	Volume of Pu Contam. Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking
200-E PAP	Solid	1943	Active		Top	0	0	0	0	0	0.00
218-E-3	Solid	1954	1954		Top	42	30	6	76	0	0.00
2607-E0	Liquid	Cerca 1985	Active		Top	0	0	0	0	0	0.00
2607-E1	Liquid	1970	Active		Top	25	11	0	0	0	0.00
2607-E11	Liquid	Cerca 1985	Active		Top	0	0	0	0	0	0.00
2607-E2	Liquid	Pre 1980	Active		Top	0	0	0	0	0	0.00
2607-E7B	Liquid	Unknown	Unknown		Top	0	0	0	0	0	0.00
2607-E8	Liquid	1978	Active		Top	0	0	0	0	0	0.00
2607-EH	Liquid	1983	Unknown		Top	0	0	0	0	0	0.00
2607-EK	Liquid	1980	Active		Top	0	0	0	0	0	0.00
2607-EM	Liquid	1984	Active		Top	0	0	0	0	0	0.00
2607-EN	Liquid	Pre 1980	Active		Top	0	0	0	0	0	0.00
2607-EP	Liquid	1984	Active		Top	0	0	0	0	0	0.00
2607-EQ	Liquid	1985	Active		Top	0	0	0	0	0	0.00
2607-ER	Liquid	Unknown	Active		Top	0	0	0	0	0	0.00
2607-GF	Liquid	Unknown	Unknown		Top	0	0	0	0	0	0.00
2703-E HWSA	Liquid	1984	Active		Top	0	0	0	0	0	0.00
2704-E HWSA	Liquid	November 1984	Active		Top	0	0	0	0	0	0.00
2715-EA HWSA	Liquid	November 1984	Active		Top	0	0	0	0	0	0.00
CTFN 2703-E	Liquid	Unknown	Unknown		Top	0	0	0	0	0	0.00

Table 14-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-SS-1.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con (sq ft)	Rad Zone (sq ft)
200-E Powerhous	None	None	None	None/Unknown	15.0	Brush/Grass	None	0	0
2101-M POND	Light Chain	RCRA Waste Site	Posted on Fence	Could Not Determine	-5.0	Non-native Grass	None	0	0
218-E-3	None	None	None	Soil cover/Backfill	3.0	Non-native Grass	None	0	0
2607-E0	Light Chain	Sani Sewer Drainfield	Posted on Fence	Soil cover/Backfill	0.0	None	None	0	0
2607-E1	Light Chain	None	Sani Sewer Drain Field	None/Unknown	0.0	Native Grass	None	0	0
2607-E11	Light Chain	Sani Sewer Drainfield	Posted on Fence	None/Unknown	0.0	Brush/Grass	None	0	0
2607-E2	Light Chain	Sani Sewer Drainfield	Posted on Fence	None/Unknown	-5.0	Brush/Grass	None	0	0
2607-EB	Chain Link Fence	None	Sani Sewer Drain Field	None/Unknown	0.0	Brush/Grass	None	0	0
2607-EH	None	Could not determine	Could not determine	Could Not Determine	0.0	None	None	0	0
2607-EK	Light Chain	None	Sani Sewer Drain Field	None/Unknown	0.0	Brush/Grass	None	0	0
2607-EM	None	Could not determine	Could not determine	Could Not Determine	0.0	Brush/Grass	Sec Police Trng	0	0
2607-EP	Light Chain	None	Sani Sewer Drain Field	None/Unknown	0.0	Brush/Grass	None	0	0
2607-EQ	Light Chain	None	Sani Sewer Drain Field	None/Unknown	0.0	Brush/Grass	None	0	0
2607-ER	Light Chain	None	None	None/Unknown	0.0	Brush/Grass	None	0	0
2607-GF	None	Could not determine	Could not determine	Could Not Determine	0.0	None	None	0	0
2703-E HWSA	None	None	None	None/Unknown	0.0	None	could not locate	0	0
2704-E HWSA	None	None	None	None/Unknown	0.0	Non-native Grass	Cover/Temp Off	0	0
2715-EA HWSA	Chain Link Fence	No Smoking	Posted on Structure	Asphalt Pavment	0.0	None	Inside Burial Grd	0	0
E I I N 2703-E	Light Chain	None	Metal Post with Plaque	None/Unknown	0.0	Brush/Grass	None	0	0

Estimated waste inflow is 5,695 gal/d (42% of capacity), but it is expected that the input will increase to 7,883 gal/d (Bovay 1991).

The drain field is constructed of 4-in.-diameter VCP, concrete pipe, or drain tile with a minimum of 8 ft (linear) per capita. The laterals are spaced 8 ft apart and are open jointed (BHI 1994). The drain field covers 8,376 ft^2 and is currently operating at 90% capacity (Bovay 1991).

14.4 2607-E7B SEPTIC TANK

Data in BHI (1994) state that this active unit has a 240-gal capacity and is located immediately northwest of the intersection of Baltimore Avenue and 4th Street (Figure 14-1). Authors could not determine the exact location during the site visit (site visit, October 1991). Dan Korte, Hanford septic tank manager, has no record of this septic tank and believes it doesn't exist (Korte 1991; Korte, personal communication 1991).

14.5 2607-E8 SEPTIC TANK

This tank was built in 1978 and is presently operational. The site includes a drain field (Cramer 1987) and is located on the east side of Baltimore Avenue across from the 2101-M building, immediately north of the 2607-EK septic tank. Figure 14-1 shows the tank to be about 200 ft east of its true position (Korte, personal communication). Waste inflow is approximately 1,960 gal/d (Bovay 1991).

The drain field consists of four lateral sets of tiles arranged in a herringbone pattern. The field covers 9,000 ft^2 and is operating at about 29% of capacity (Bovay 1991).

14.6 2607-EH SEPTIC TANK

Data in BHI (1994) show the 2607-EH septic tank was built in 1983 and remains in use today. The unit includes a drain field receiving about 1.36 m^3 of sanitary wastewater and sewage per day (Cramer 1987). It is believed to be located on the west side of Baltimore Avenue adjacent to the east side of the 2101-M building (Figure 14-1). Authors could not determine the tank's location during the site visit (site visit by authors, October 1991). Dan Korte, Hanford septic tank manager, has no record of this septic tank and believes it doesn't exist (Korte, personal communication).

14.7 2607-EK SEPTIC TANK

This septic tank and drain field are located about 200 ft east of Baltimore Avenue and 700 ft south of the 2607-E8 septic tank. The tank's location is incorrectly plotted on Figure 14-1 (Korte, personal communication). The tank and drain field were constructed in 1980. The tank receives about 6,395 gal (64% of capacity) of waste per day. The septic tank is believed to have a 15,000- to 19,000-gal capacity (Korte 1991). The drain field is about 2,200 ft^2 and is operating at about 387% of its design capacity.

14.8 2607-EM SEPTIC TANK

The septic tank and drain field are located southeast of the Akron Avenue and 4th Street intersection (Figure 14-1). The system was built in 1984 and receives waste from the 2721-E building (Korte 1991). The septic tank receives approximately 1,685 gal of waste per day which is estimated to be 50% of the design capacity. The tank has a maximum capacity of 5,000 gal. The associated drain field is 1,320 ft^2 and is operating at about 170% of its design capacity (Bovay 1991).

14.9 2607-EP SEPTIC TANK

This system consists of a septic tank and drain field constructed in 1984. The septic tank is adjacent to the northeast corner of building 2721-EA (Hanford drawing H-2-44500, Sheet 3). The location shown in Figure 14-1 is incorrect (Korte, personal communication). The tank receives about 495 gal of waste per day, approximately 49% of its designed capacity. The drain field is operating at about 131% of its capacity (Bovay 1991).

14.10 2607-EQ SEPTIC TANK

The 2607-EQ septic tank is located approximately 150 ft southeast of the Ames Avenue and 2nd Street intersection (Figure 14-1). This system was built in 1985 and consists of a 10,000-gal septic tank (Korte 1991) and a 4,644 ft^2 drain field (Bovay 1991). Approximately 2,770 gal of waste are discharged to the tank per day, about 41% of its design capacity. The drain field is operating at an estimated 79% capacity (Bovay 1991).

14.11 2607-ER SEPTIC TANK

Data contained in BHI (1994) lists the septic tank's location as 500 ft southeast of the Akron Avenue and 4th Street intersection between the 2607-EP and 2607-EM septic tanks (Figure 14-1). The septic tank is actually located southwest of the Akron Avenue and 4th Street intersection where Baltimore Avenue is intersected by railroad tracks (site visit by authors, October 1991). The septic tank has an estimated 1,000-gal capacity (Korte 1991). Information pertaining to the system's design capacity and daily waste estimates were not contained in BHI (1994).

14.12 2607-GF SEPTIC TANK

BHI (1994) reports that this tank is north of the Dry Materials Receiving and Handling Facility and across the railroad tracks that run on the north of that facility (Figure 14-1). The tank is listed as active, but not in use (Cramer 1987). Dan Korte, Hanford septic tank manager, has no record of 2607-GF septic tank and authors could not locate tank during site visit (site visit, October 1991).

14.13 2607-EO SEPTIC TANK

This tank is located about 150 ft west of building 2711-E. This tank is not in listed in Ecology et al. (1991). The tank holds 2,500 gal and has 560 gal of daily input. It discharges to a 780 ft^2 drain field. The tank is operating at 33% of capacity and the drain field is running at 95% capacity (Bovay 1991).

14.14 2607-EN SEPTIC TANK

This tank is not identified in Ecology et al. (1991). The tank is situated about 100 ft south of the 2727-E building. The 2607-EN septic tank has a 2,500-gal capacity and receives an estimated 545 gal/d. The waste drains to a 360 ft^2 drain field. The tank, at this input level, is at 32% capacity, while the drain field is running at 200% of capacity (Bovay 1991).

14.15 2607-E2 SEPTIC TANK

This tank is not identified in Ecology et al. (1991), but is located in the 200-SS-1 Operable Unit. It is about 200 ft northeast of the intersection of Baltimore Avenue and 1st Street (Korte, personal communication). It has a volume of 6,620 gal and has a daily input of 630 gal. There are two drain fields associated with this tank, the original field having an area of 9,831 ft^2 and a new drain field of 25,000 ft^2 (Bovay 1991). There is no indication in the literature as to whether they are both active or not.

14.16 2607-E11 SEPTIC TANK

This septic tank is located 100 ft southeast of the Dry Materials Receiving and Handling Facility. It is a 2,250-gal tank that receives about 835 gal/d of sanitary wastewater and sewage. There is a 1,275 ft^2 drain field included in this site. The volume handled by this system is 55% of the tank's operational capacity and 87% of the drain field's capacity (Bovay 1991).

14.17 UNNUMBERED SEPTIC TANKS

There are two new septic tanks located in the 200-SS-1 Operable Unit. One is adjacent to the 281-E-3 burial ground and one is about 700 ft northwest of the intersection of Ames Avenue and 1st Street. ICF KH is responsible for their construction and maintenance (Korte, personal communication). No information on their volume or discharge was found in the literature.

14.18 2703-E HAZARDOUS WASTE STORAGE AREA

Liquid hazardous waste is temporarily stored on an asphalt pad at this site prior to burial. Typical waste held in the staging area included about 11,126 kg of alkaline liquids and sodium hydroxide, 500 kg of sodium dichromate containing process solutions, and 415 kg of waste acids. Weekly documented inspections are performed by plant personnel (Cramer 1987).

14.19 CHEMICAL TILE FIELD NORTH OF 2703-E HAZARDOUS WASTE STORAGE AREA

The tile field is an inactive waste site located about 800 ft from Baltimore Avenue and 4th Street and 200 ft east of Atlanta Avenue (Figure 14-1). The tile field received mixed waste while in operation. BHI (1994) contains very little information about this site. Its history is undetermined at this time. Authors could not locate asphalt pad for staging area at time of site visit.

14.20 2704-E HAZARDOUS WASTE STORAGE AREA

The 2704-E HWSA is an active site for temporary storage of hazardous materials. Typical wastes contained in the staging area over the past year include 1,433 kg of antifreeze, 60 kg of grease, 186 kg of diesel fuel, and 190 kg of asphalt. Weekly documented inspections are performed by plant personnel (Cramer 1987). Building 2704-E has been dismantled and removed. Offices in mobile trailers (MO-104, MO-256, MO-257) now occupy this area (site visit by authors, November 1991).

14.21 2715-EA HAZARDOUS WASTE STORAGE AREA

Waste containers consisting of waste paint and thinning solvents are temporarily stored at this facility. The site became operational in November 1984. Weekly documented inspections are performed by plant personnel.

The 2715-EA HWSA is a metal shed with a chain link fence as the front wall. A metal sign on the fence denotes site identification. Only "No Smoking" signs were observed on the structure (site visit by authors, November 1991). Adjacent to the west side of the shed are two conex boxes and two chain link fenced areas used as additional storage space. They are not marked but it is believed that they are extensions of the 2715-EA HWSA. One fenced area was labeled with "hazardous waste 90-day storage." The contents of the conex boxes could not be determined (site visit by authors, November 1991).

14.22 2101-M POND

This site became operational in 1983 and receives small volumes of swamp-cooler condensate and overflow drain wastewater from the 2101-M air conditioning system. In addition, the pond also receives barium chloride laboratory waste solutions estimated at less than 500 gal/yr, and 1 to 10 kg/yr of nitric and hydrochloric acid. A part A permit for interim closure has been submitted (Cramer 1987). The pond is encompassed by a light-weight chain barricade with "RCRA WASTE SITE DO NOT DISTURB," "DRY ROT," and "CONTACT W. A. RETTERER @ 373-2619" warning signs. The site is covered with heavy vegetation and a few small trees. Two berms of soil trending east west lie on either side of the pond (site visit by authors, November 1991).

15.0 OPERABLE UNIT 200-IU-6

Commonly called the Gable Mountain Pond, Operable Unit 200-IU-6 is located approximately 1.25 mi north of the 200 East Area. There are only two inactive sites, ponds 216-A-25 and 216-N-8, in this operable unit. Figure 15-1 summarizes the operational history of these two sites. Table 15-1 provides the site locations and waste type summary table for Operable Unit 200-IU-6. Operational dates and status, site dimensions and waste volumes for Operable Unit are provided in Table 15-2. Table 15-3 provides a summary of current site conditions. There were no organic or inorganic contaminants identified in BHI (1994) associated with the sites of this operable unit.

15.1 216-A-25 POND/UPR-200-E-34

The 216-A-25 Gable Mountain Pond is a 71 acre natural depression located 1 mi south of the west end of Gable Mountain (Hanford photograph A-53). It is the largest seepage disposal facility of the Hanford pond network (Hanford photograph A-54). In 1957 it was commissioned for service to receive cooling water from the PUREX Plant. Gable Mountain Pond has routinely received low-level liquid wastewater from B Plant, the 242-A evaporator, the 244-AR vault, 200 East Area powerhouse, and the 241-A tank farm (Lundgren 1970; BHI 1994). Between its commissioning in 1957 and its decommissioning in 1987, the site received approximately 307 billion liters of liquid mixed waste (Coony and Thomas 1989). The radionuclides present in the waste steams disposed at this site include: americium-241, tritium, ruthenium-106, cesium-137, promethium-147, strontium-90, and plutonium (Brown et al. 1990; Aldrich 1984).

Although the pond has received low levels of chemically and radioactively contaminated wastes since its startup, a single UPR (UPR-200-E-34) occurred on June 11, 1964, resulting in relatively large quantity of short and long-lived mixed fission products to B pond, Gable Mountain Pond, and the ditch associated with B pond (216-B-3-1 ditch). Bentonite clay was intentionally introduced to the pond bottom as an attempt to tie-up radionuclides in the upper sediment layers after the release (Maxfield 1979). Copper sulfate was added on two occasions to eliminate the algae and invertebrate life, thus breaking the important links in the food chain of the migratory water fowl. Three parts per million was the desired water concentration (Maxfield 1979).

Cleanup actions started in July 1984. The stabilization was completed in December 1988. The unit was backfilled with clean pit run soil and cobbles to a minimum of 2 ft above the original shoreline (Hanford photograph A-55) (Hayward 1989). A recent site visit (October 1991) showed evidence of a new pond that might have developed over or adjacent to the old one. The site has re-vegetated after a 1-ft layer of topsoil was spread over the entire backfilled area (Hanford photograph A-56). Wells 699-53-47, 699-55-50C, and 699-52-52 monitor the unit (McGhan and Damschen 1979).

15.2 216-N-8 POND

The 77,800 m^2 216-N-8 pond serves as a natural basin for a large watershed area. Located 3/4 mi northwest of Gable Mountain Pond, it was an intermittent seasonal unit prior to expanding Gable Mountain Pond use (Hanford photograph A-57).

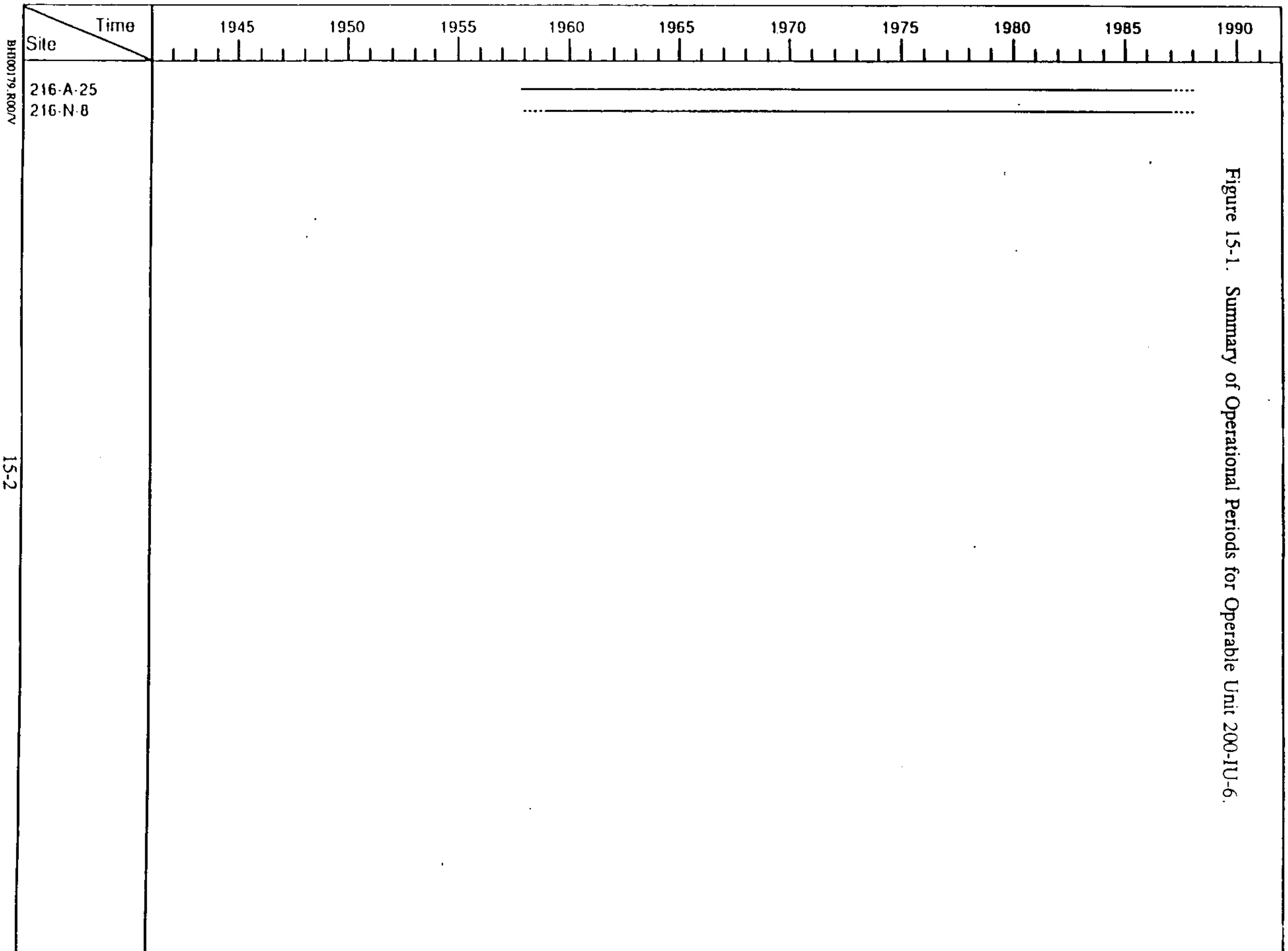


Figure 15-1. Summary of Operational Periods for Operable Unit 200-IU-6.

Table 15-1. Site Location and Waste Type Summary Table for Operable Unit 200-IU-6.

Site	Type of Site	Status	Coordinates	Type of Waste
216-A-25	Pond	Inactive	N51748 W47095, N54191 W50490 (centerline)	Mixed Waste
216-N-8	Pond	Inactive	N60000 W55000, N58000 W54000	Low-Level Waste

Table 15-2. Operational Dates and Status, Site Dimensions, and Waste Volumes Summary Table for Operable Unit 200-IU-6.

Site	State	Start Date	End Date	UPR Occurrence Date	Dim Ref	Length (ft)	Width (ft)	Dispo Depth (ft)	Volume of Pu Contam Soil (cu m)	Volume of Waste Disposed (cu m OR L)	PNL Hazard Ranking	Associated UPR(s)
216-A-25	Liquid	December 1957	1987		Top	0	0	0	150000	307000000000	0.00	UPR-200-E-34
216-N-8	Liquid	1958	1987		Top	0	0	0	0	0	0.00	

Table 15-3. Summary of Site Visit Parameters Observed by Author During September 1991.

Area of surface contamination and radiation zone, as defined by Health Physics in September 1991, is also included (if available). Height refers to the current height of the stabilized facility in feet above (+) or below (-) grade. Operable Unit 200-IU-6.

Site	Barrier	Warning Sign	Markers	Stabilization	Height (ft)	Vegetation	Access Restrictions	Surf Con (sq ft)	Rad Zone (sq ft)
216-A-25	Light Chain	Surface Contamination	Concrete Post w/ Plaque	Gravel/Soil Cover	0.0	Non-native Grass	None	0	3092760
216-N-8	None	Could not determine	None	Could Not Determine	0.0	None	could not locate	0	0

After Gable Mountain Pond started receiving wastes in 1958, the water table was raised in the general area and the 216-N-8 "West Pond" became permanent. Although it was never directly used as a waste disposal site, it contains relatively high amounts of radionuclides having the highest gross alpha (naturally occurring except for tritium) concentrations of all the 200 Area ponds (Strait and Moore 1981). The actual source is unknown (Sula et al. 1981). Prior to existence of west pond, the area was used as a sewage sludge disposal site for the early Hanford construction camp. Consequently, high levels of alkalinity and phosphate have been measured in the pond.

The authors could not determine the exact location of the pond. No radiological surface contamination has been detected and no change in activity since the survey of 1988 (Hanford photograph A-58) (Environmental Protection hardfiles).

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Table 16-1 provides a list of key documents used in preparing this report.

Table 16-1. Key References Containing Supporting Data. (sheet 1 of 4)

Aldrich, R. C., 1985, *Radioactive Liquid Wastes Discharged to Ground in the 200 Area During 1984*: RHO-HS-SR-84-3 4Q Liq P. This report discusses radioactive discharges to the ground in the 200 Areas. There are tables of amounts of radioactive liquid put into sites, and totals of specific radioactive constituents. The report is issued quarterly.

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Delaney, C. D., *Geology and Hydrology of the Hanford Site: A standardized text For Use in Westinghouse Hanford Company Documents and Reports*: WHC-SD-ER-TI-0003. As suggested by the title, this report gives extensive information on the geology and hydrology of the Hanford Site.

DOE/RL-91-03, *Annual Report for RCRA Ground-Water Monitoring Projects at Hanford Site Facilities For 1990*. This is an excellent report summarizing groundwater monitoring at the Hanford Site.

Environmental Protection Files (unpublished), various dates and authors, stored at the Environmental Protection building in the 200 West Area. These files contain extensive information on UPRs and remedial action taken (if any) at the time of the release. These files can only be accessed in person and there is very limited help available for file searches.

Table 16-1. Key References Containing Supporting Data. (sheet 2 of 4)

Fecht, K. R., G. V. Last, and K. R. Price, 1977, *Evaluation of Scintillation Probe Profiles from 200 Area Crib Monitoring Wells*: ARH-ST-156 or UC-70, 3 volumes. This reports presents the detailed results of extensive scintillation surveys performed in 1967. Individual plots of logging runs and detailed well location maps, including boundaries of disposal sites, are included. The purpose of these surveys is to quantify the distribution, redistribution, and decay of radionuclides beneath crib facilities in the 200 Area.

Health Physics Scheduled and Supplemental Radiation Survey Forms (unpublished), 1990, stored at Health Physics building in the 200 West Area. These files contain extensive radiological data for annual, periodic, and special request surveys. Additional surveys of site-specific areas can be performed on short notice based on an informal request.

Held, K. R., 1956, *Unconfined Underground Radioactive Waste and Contamination in the 200 Areas*: HW-41535. This report has paragraph descriptions of waste sites and their status as of 1956. All of this information has been placed in BHI (1994).

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HW-33305, *Radioactive Liquid Waste Disposal Facilities*, 1954. This document is a compilation of two other documents; HW-27227 and HW-28471. The report has tables composed of site name, structure, coordinates, elevation, waste source, and drawing references. All of this information has been placed in BHI (1994).

Jungfleisch, F. M., 1983, *Supplemental Information for Preliminary Evaluation of the Waste Inventory in Hanford Tanks through 1980*: SD-WM-TI-058 RO. This is a tabulation of the radioactive waste material in the tank farms by isotope with quantities listed in moles and activities in curies.

McCullugh, R. W., and J. R. Cartmell, 1968, *Chronological Records of Significant Events in Separations Operations*: ARH-780. This report has summary paragraphs of UPR sites in the 200 Areas. All of this information has been complied into BHI (1994).

Meinhardt, C. C., and J. C. Frostenson, 1979, *Current Status of 200 Area Ponds*: RHO-CD-798. This document discusses active (as of 1979) ditches, ponds, and retention basins used for the disposal of low-level waste, and their potential in keeping radiation from migrating.

Table 16-1. Key References Containing Supporting Data. (sheet 3 of 4)

Morton, R. L., 1980, *Current Status of Outdoor Radiation Areas in the 200 Areas*: RHO-CD-1048. This document presents tables of waste sites, their radiation contamination estimates and current zone posting.

Nelson, M. A., 1980, *Estimated Volume of Contaminated Soil in TRU/LLW Sites at Hanford*: RHO-CD-827. This report has complete descriptions/definitions of waste sites; such as cribs, trenches, etc. The back of the document has computer printouts of waste volumes sent to soil, and the amount of plutonium discharged in kgs and percent.

Oldhan, R. W., 1991, Westinghouse Internal Memorandum, Subject: Underground Injection Wells. This is a recently prepared summary of 28 french drains and underground injection wells that are located in the immediate vicinity of the PUREX Plant.

Open File Report 75-625, *Geology and Hydrology of Radioactive Solid-Waste Burial Grounds at the Hanford Reservation, Washington*. This document investigates the geology via the use of geologic cross sections and hydrology of the actual waste sites, using existing data. Much of this data is also contained in later geologic reports.

PNL-7346, *Hanford Site environmental report for calendar year 1989*. This report presents a good overview of the environmental monitoring programs at Hanford and includes summaries of soil, water, air, flora and fauna monitoring data.

Retired Facilities Quarterly Inspection Report Second Quarter FY1982, 1982, Radiological Engineering. The report discusses the results of the second quarter review of the investigated facilities. These facilities are found in both the 200 East and West Areas. There are complete schematics of each waste site included in the report.

RHO-LD-42, *Long-Term Management of Low-Level Waste Technology Development Program Plan, 1978*. This report discusses the technology development phase of the Long-Term Low-Level Waste Program.

Rodenhizer, D. G., 1987, *Hanford Waste Tank Sluicing History*: SD-WM-TI-302. This document consolidates all current information on past Hanford Site retrieval operations for the SSTs so that it can be applied to the double shell tanks.

Table 16-1. Key References Containing Supporting Data. (sheet 4 of 4)

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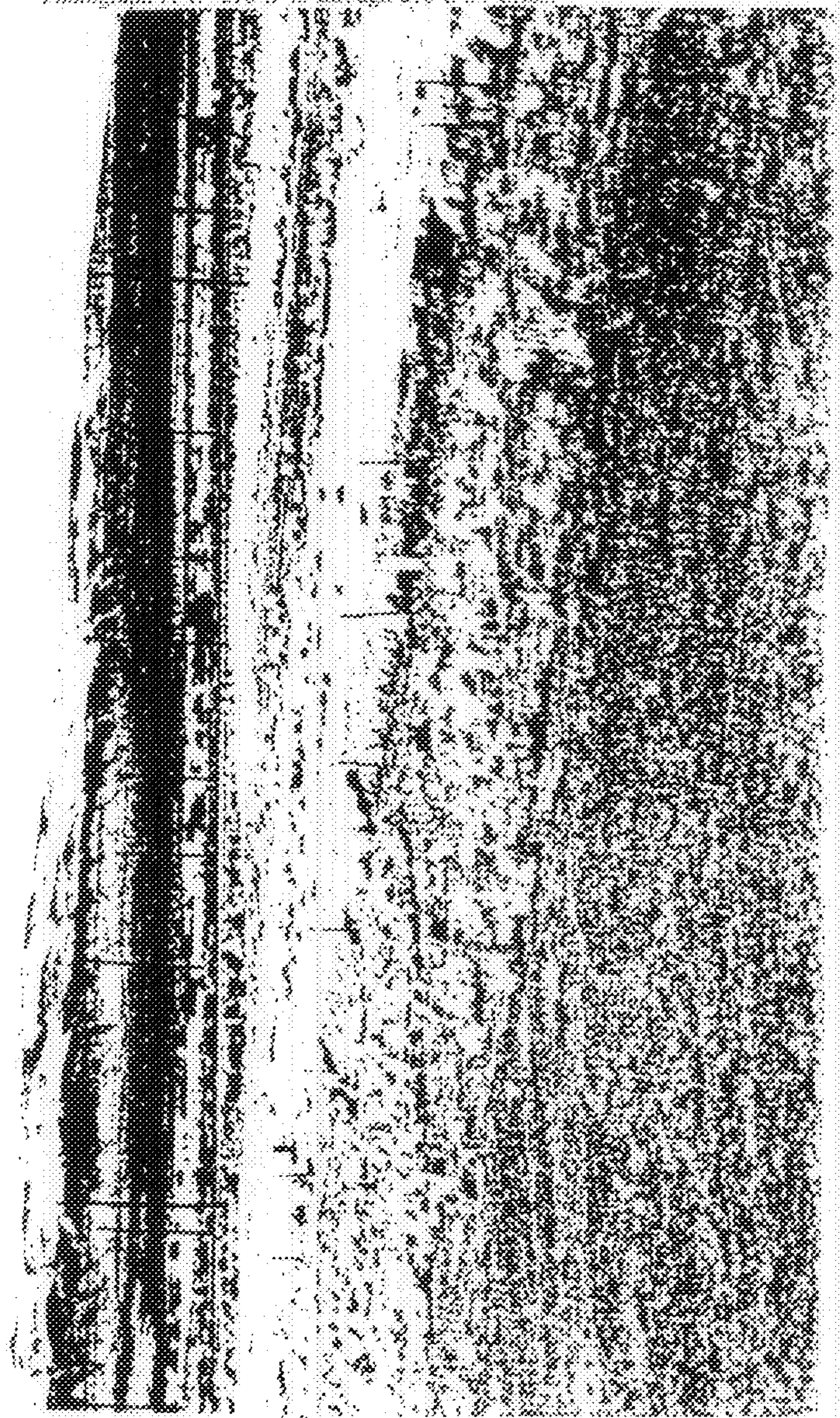
Stenner, R. D., K. H. Cramer, K. A. Higley, S. J. Jette, D. A. Lamar, T. J. McLaughlin, D. R. Sherwood, and N. C. Van Houten, 1988, *Hazard Ranking Evaluation of CERCLA Inactive Waste Sites at Hanford*: PNL-6456 Volume 1. This report discusses Hanford Site geology, meteorology, and hydrology. Native biota, population and air quality are also touched upon. This document is one of the main BHI (1994) reference documents.

APPENDIX A

PHOTOGRAPHS

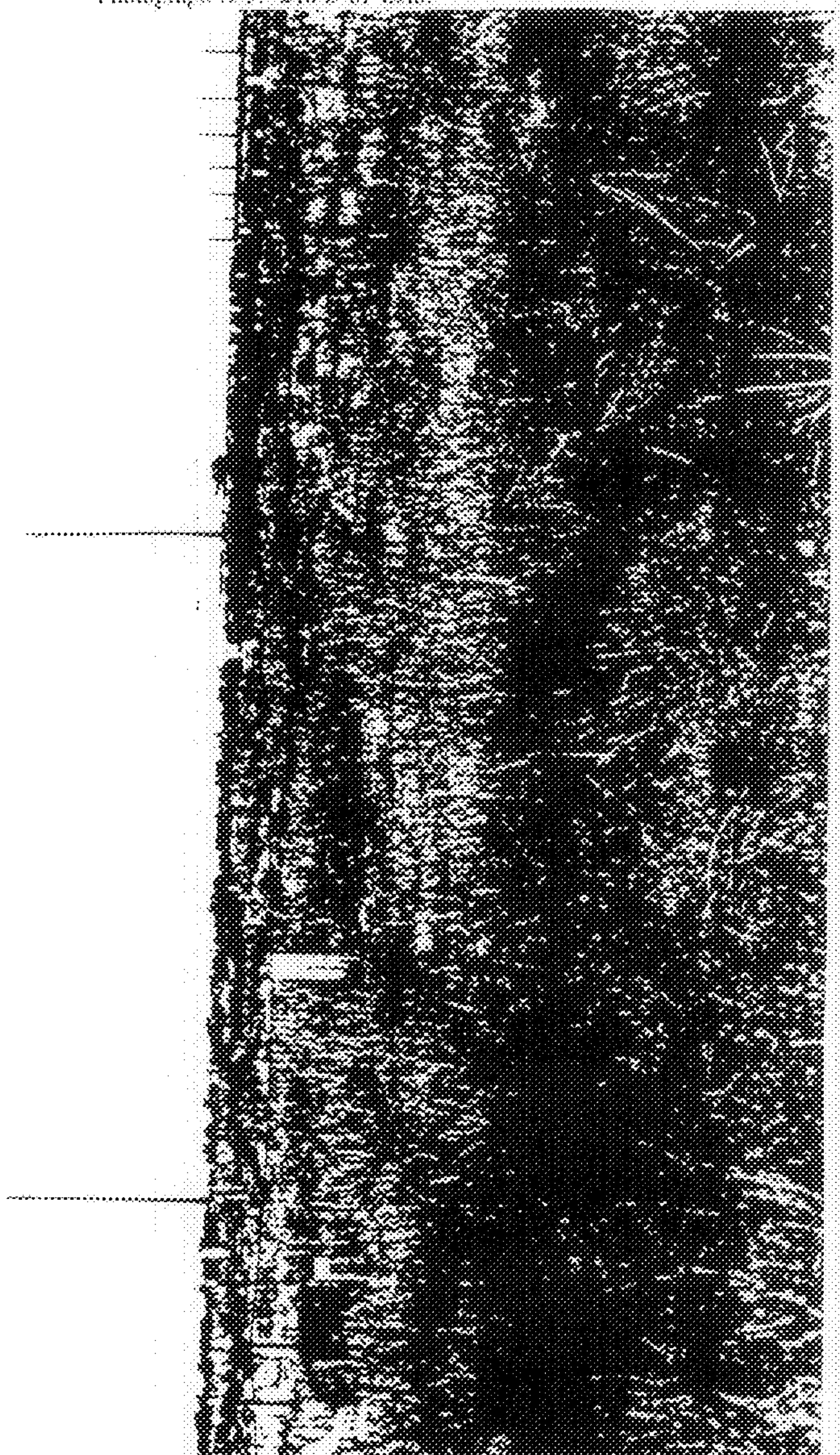
(Note: All photographs are poor quality reproductions taken from the original unpublished document.)

Photograph A-1. 216-B-43 through 216-B-50 Cribs.



Photograph A-2. 216-B-57 Trench.

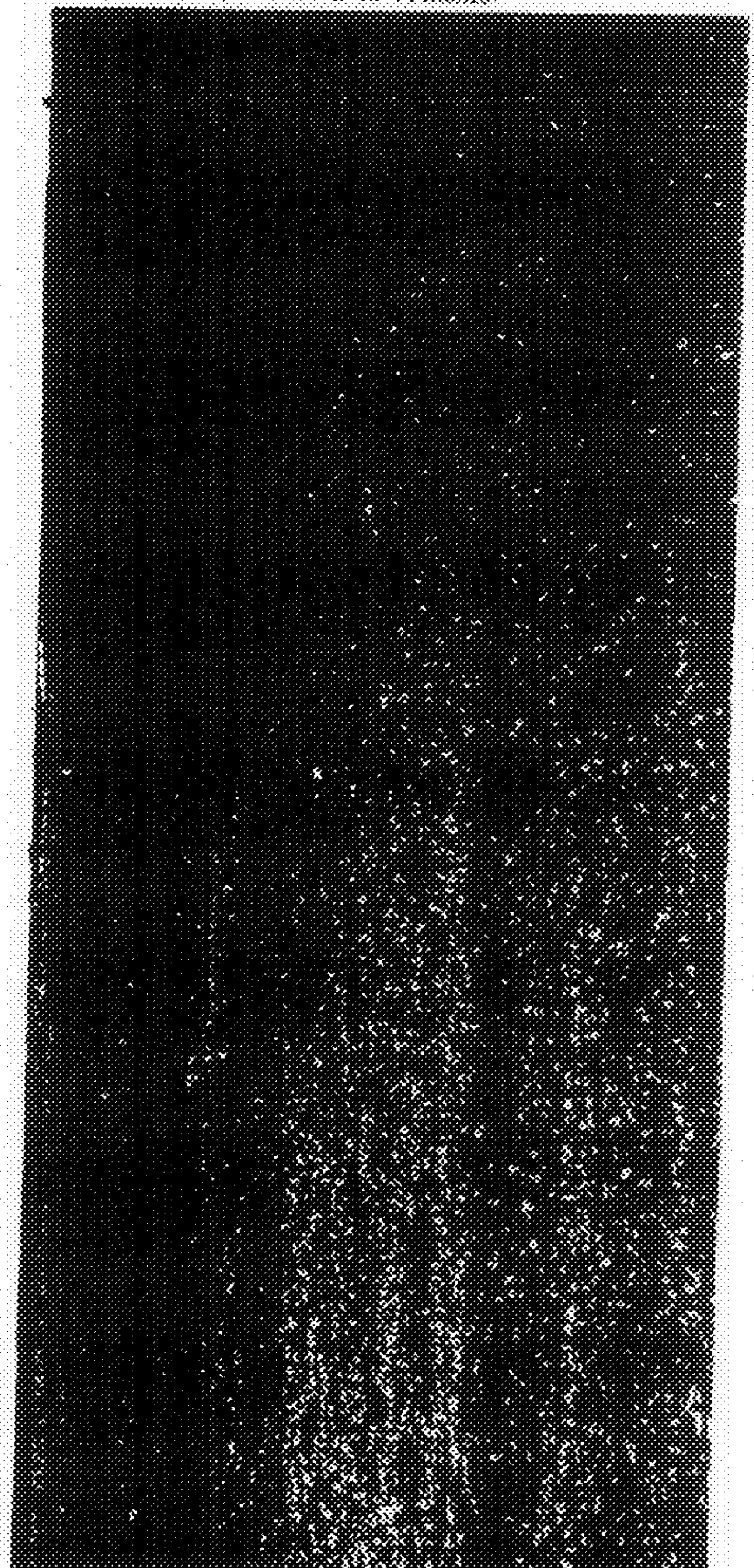
Photograph A-3. 216-B-61 Crib.



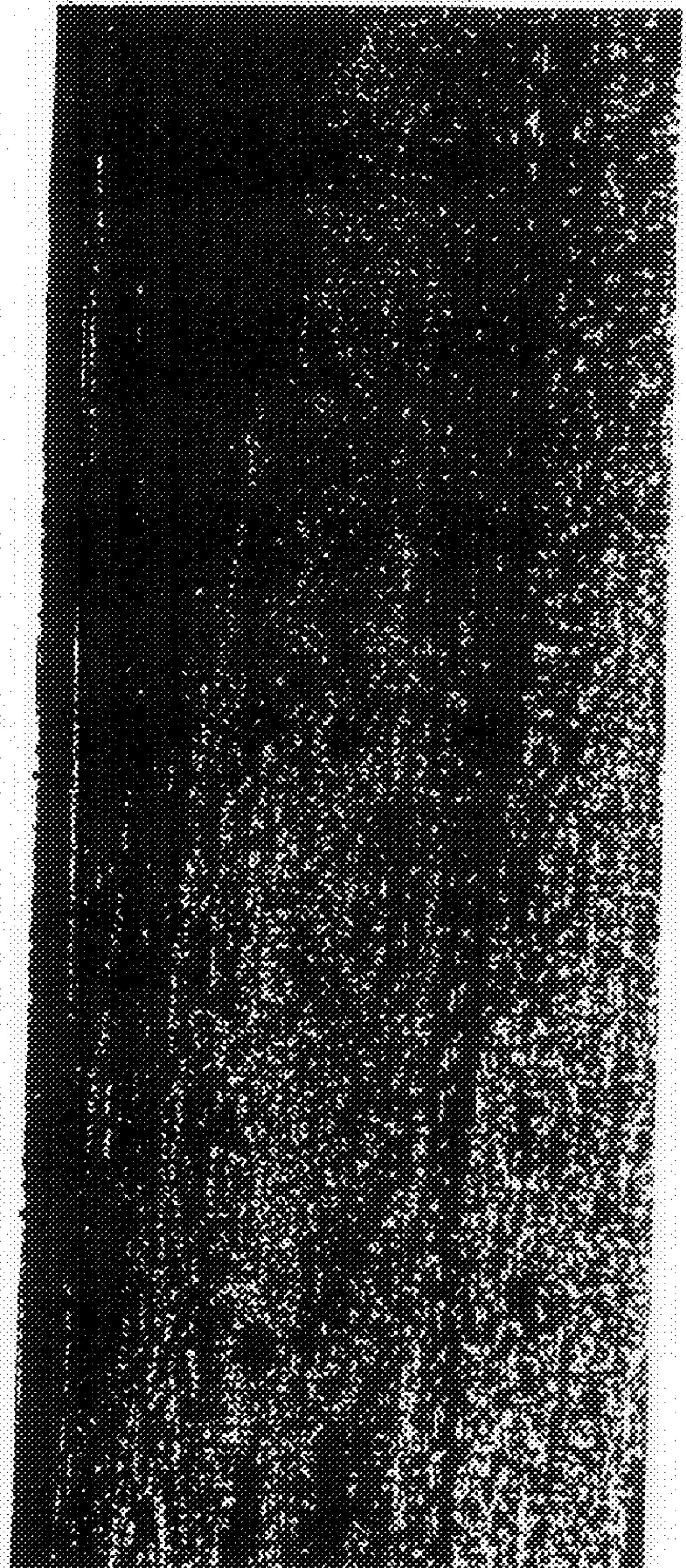
Photograph A-4. 216-B-14 through 216-B-19 Cribs.

Photograph A-5 216-B-14 through 216-B-19 Cribs (current conditions)

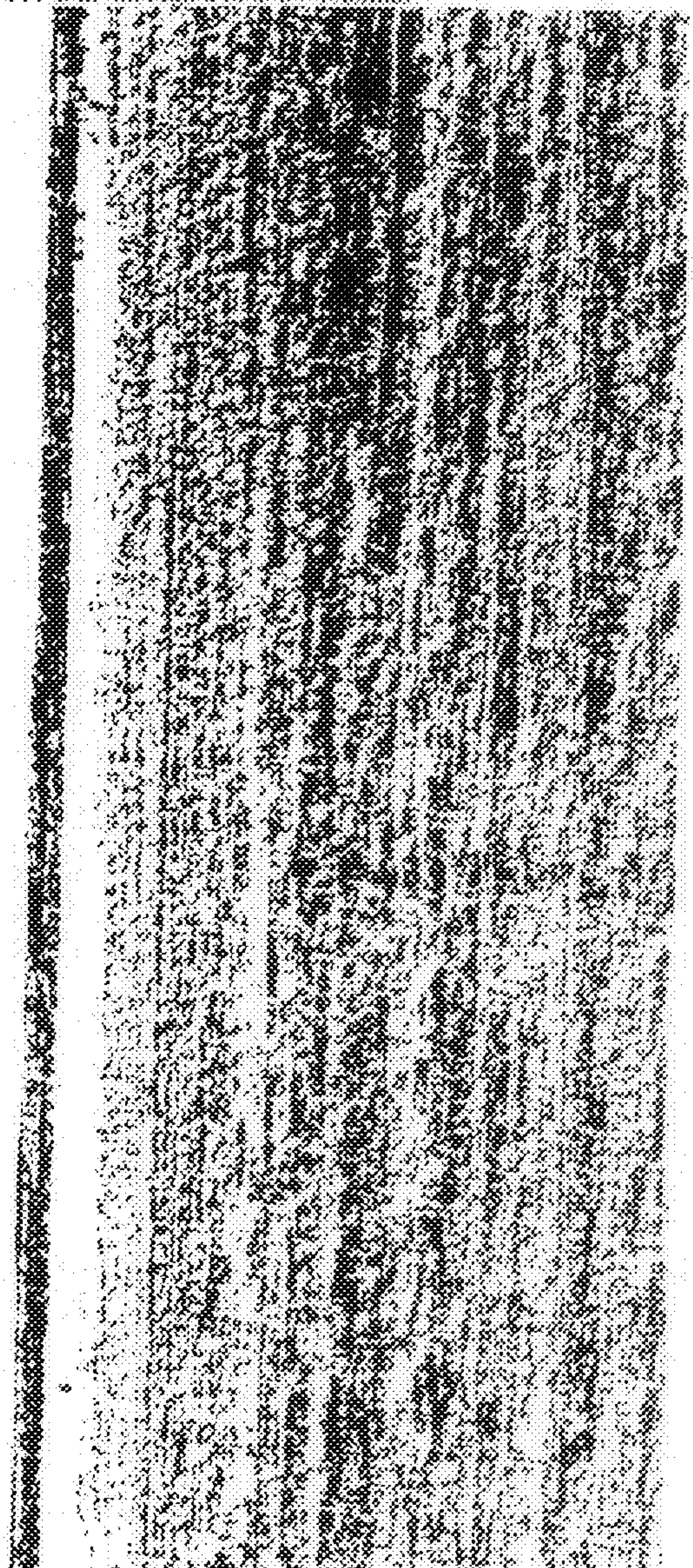
Photograph A-6. 216-B-20, 216-B-21, and 216-B-22 Trenches.



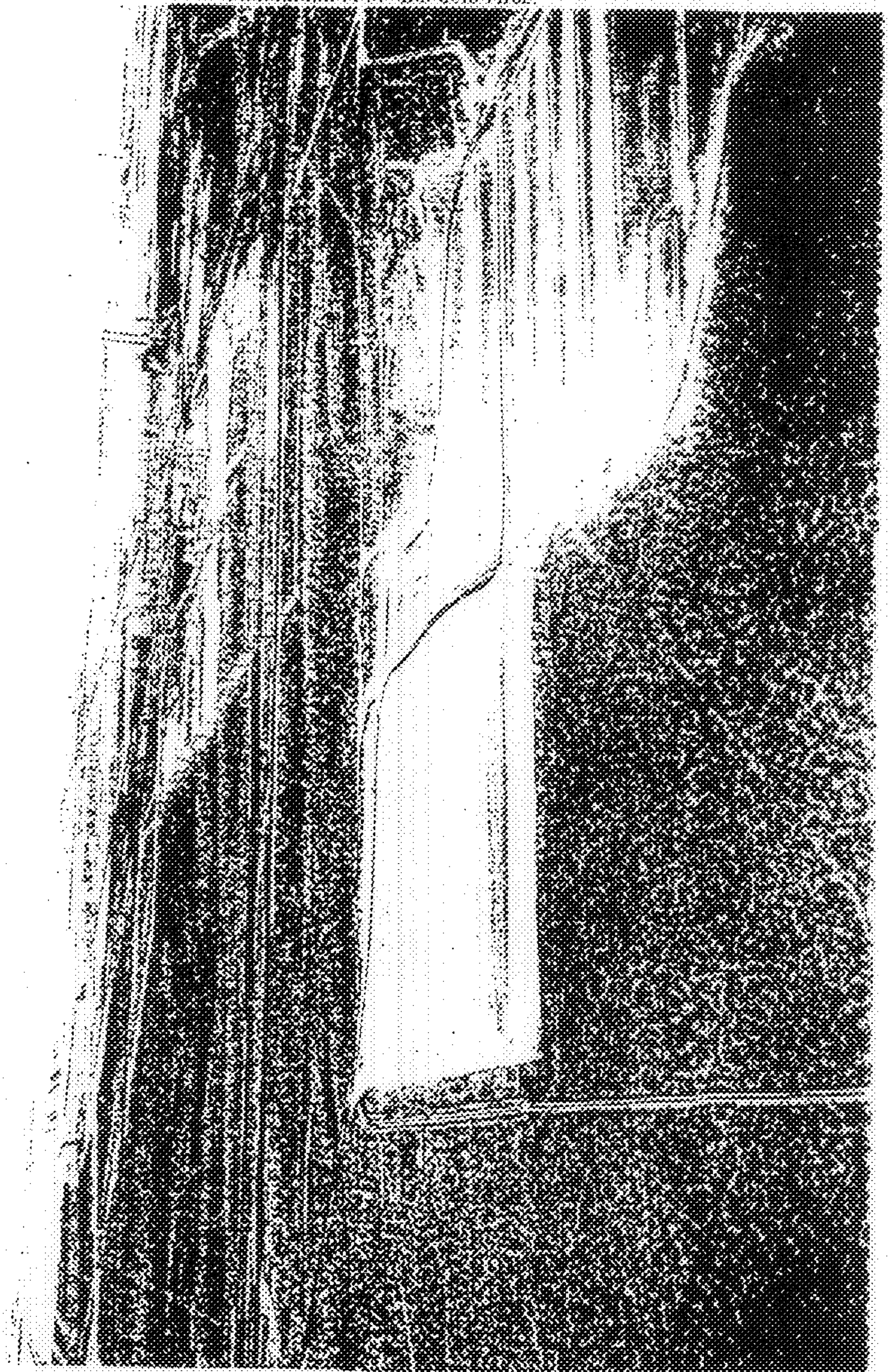
Photograph A-7. 216-B-23 through 216-B-28, and 216-B-52 Trenches



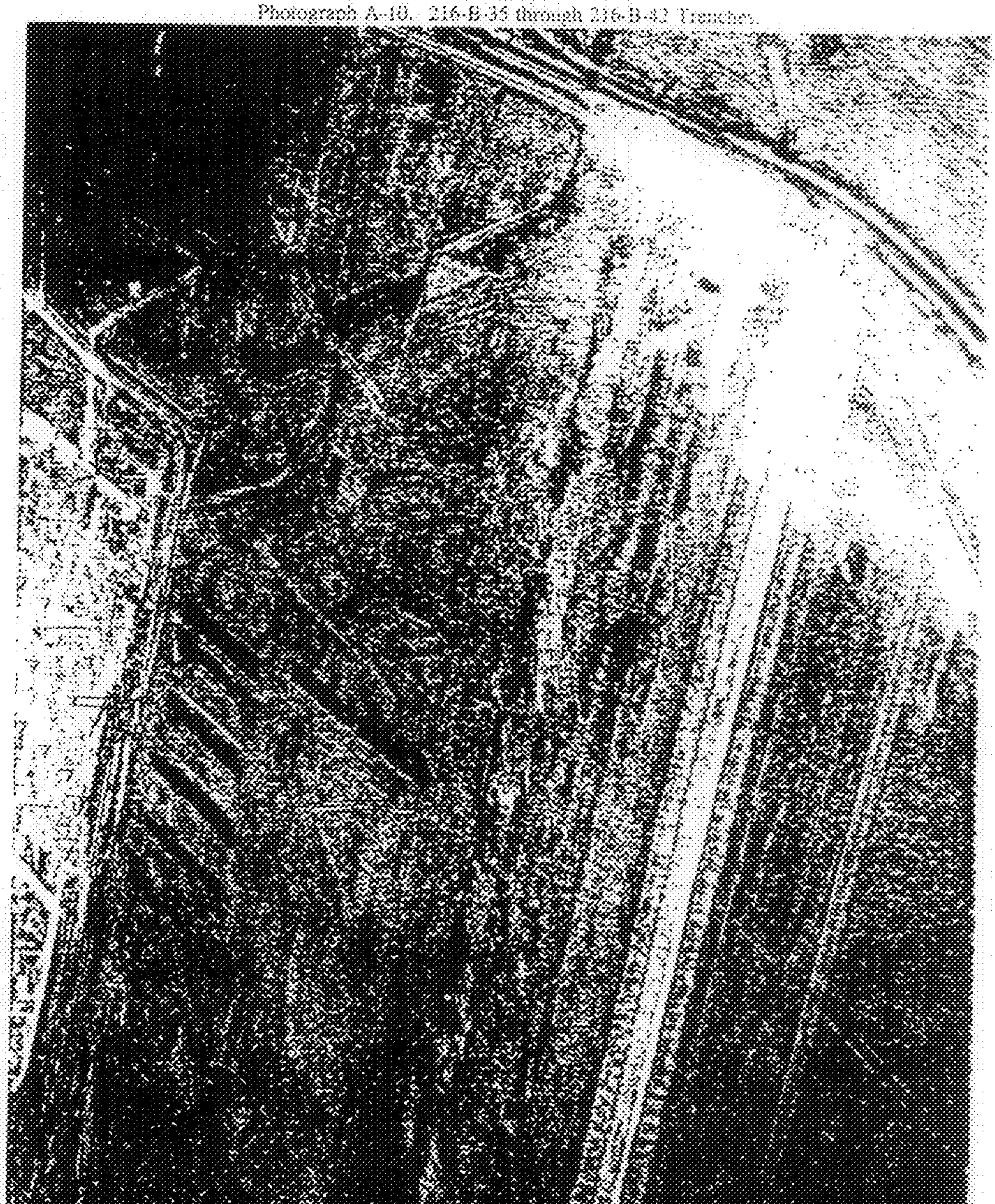
Photograph A-8. 216-B-29 through 216-B-34 Trenches



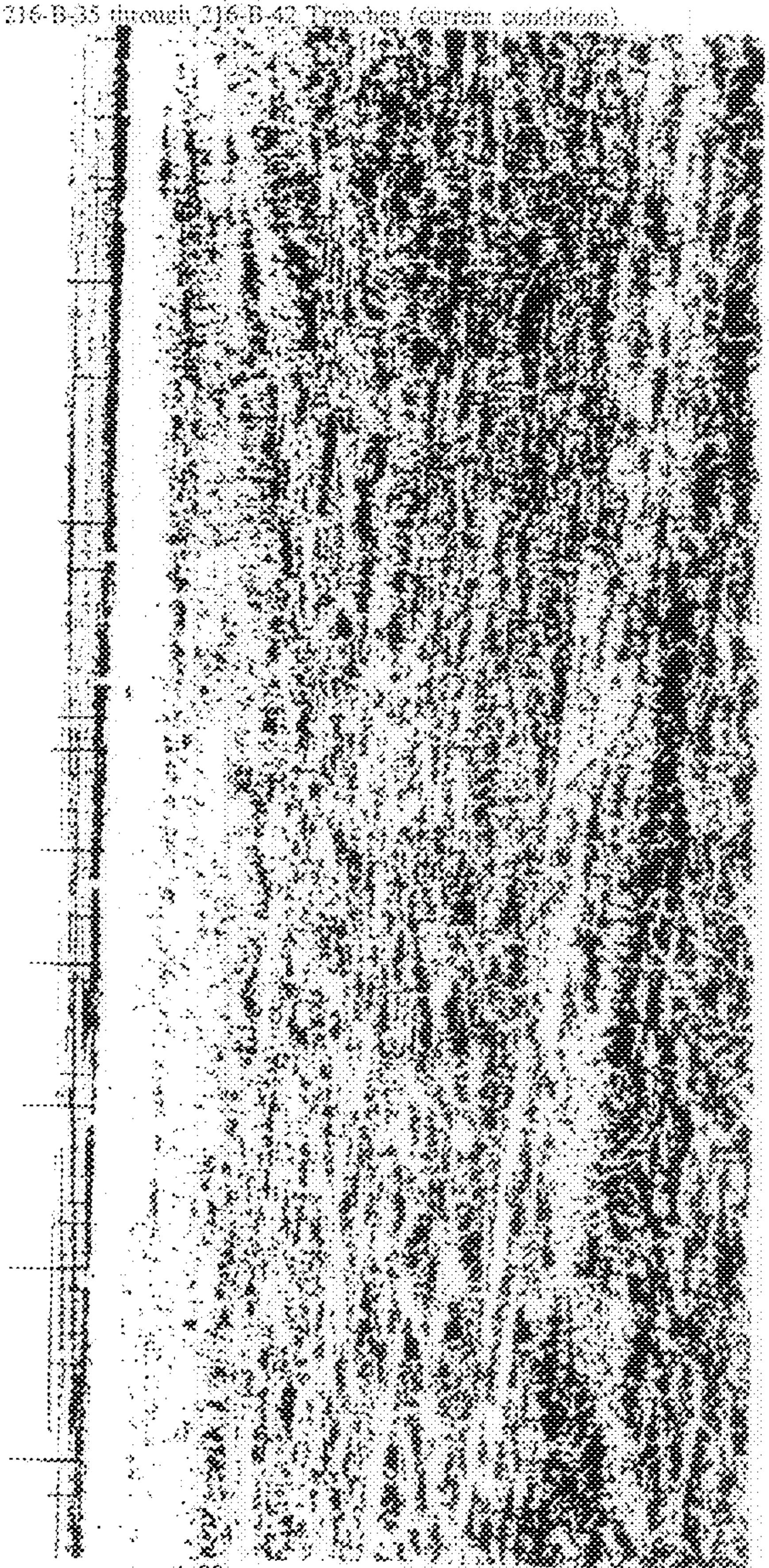
Photograph A-9. BC Crib Area.



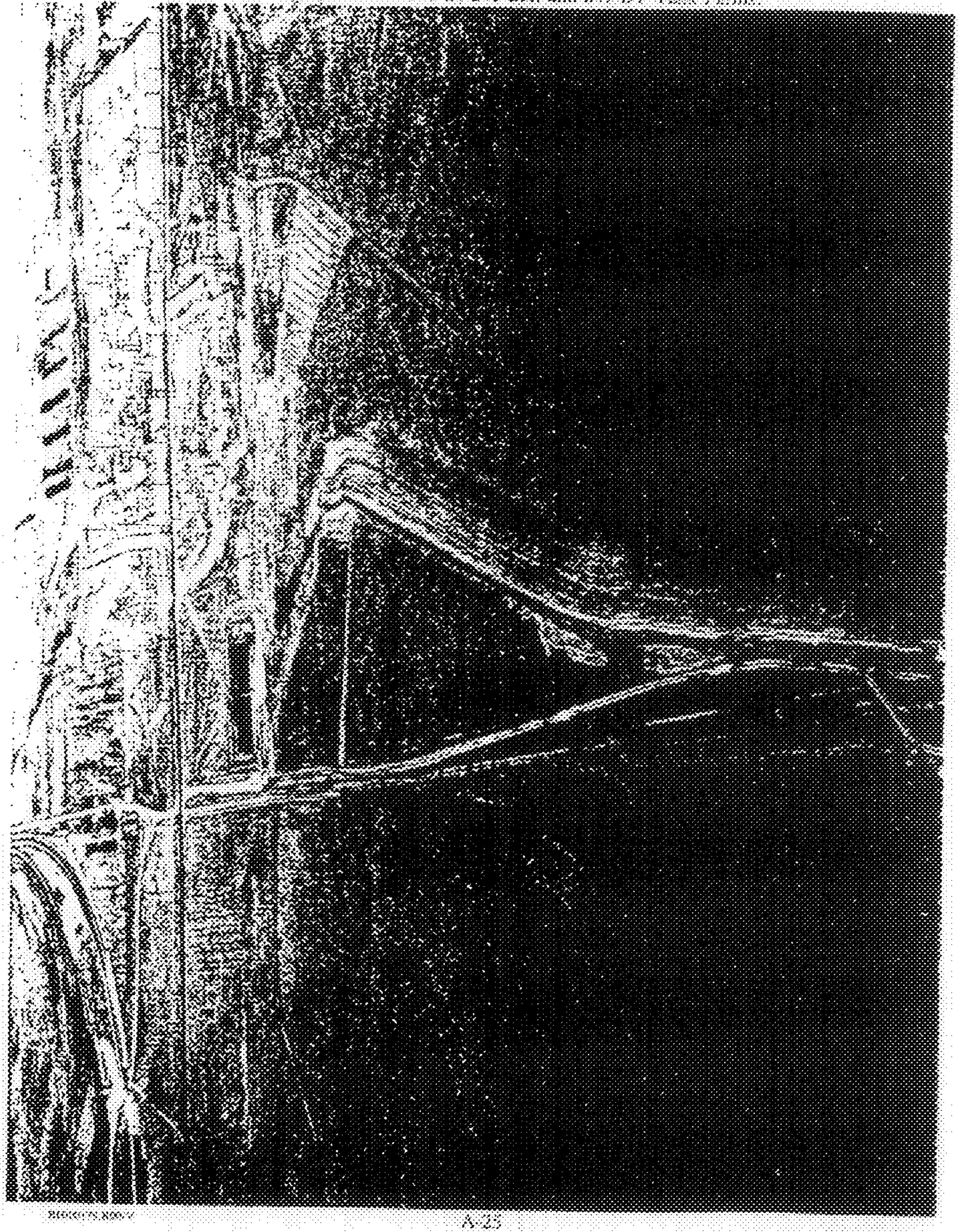
Photograph A-10. 216-B-35 through 216-B-42 Trenches.



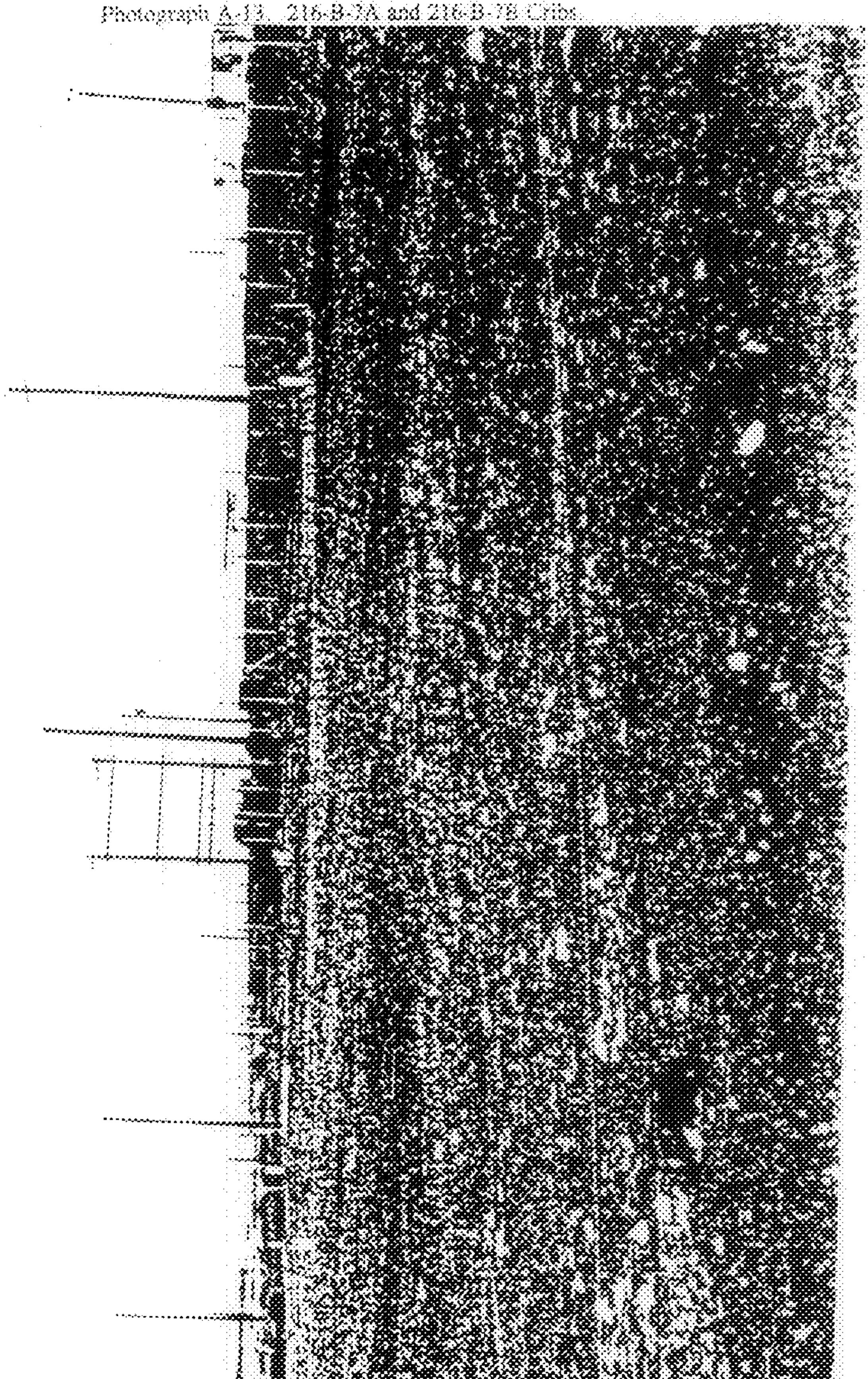
Photograph A-11. 216-B-35 through 216-B-42 Trenches (current conditions).



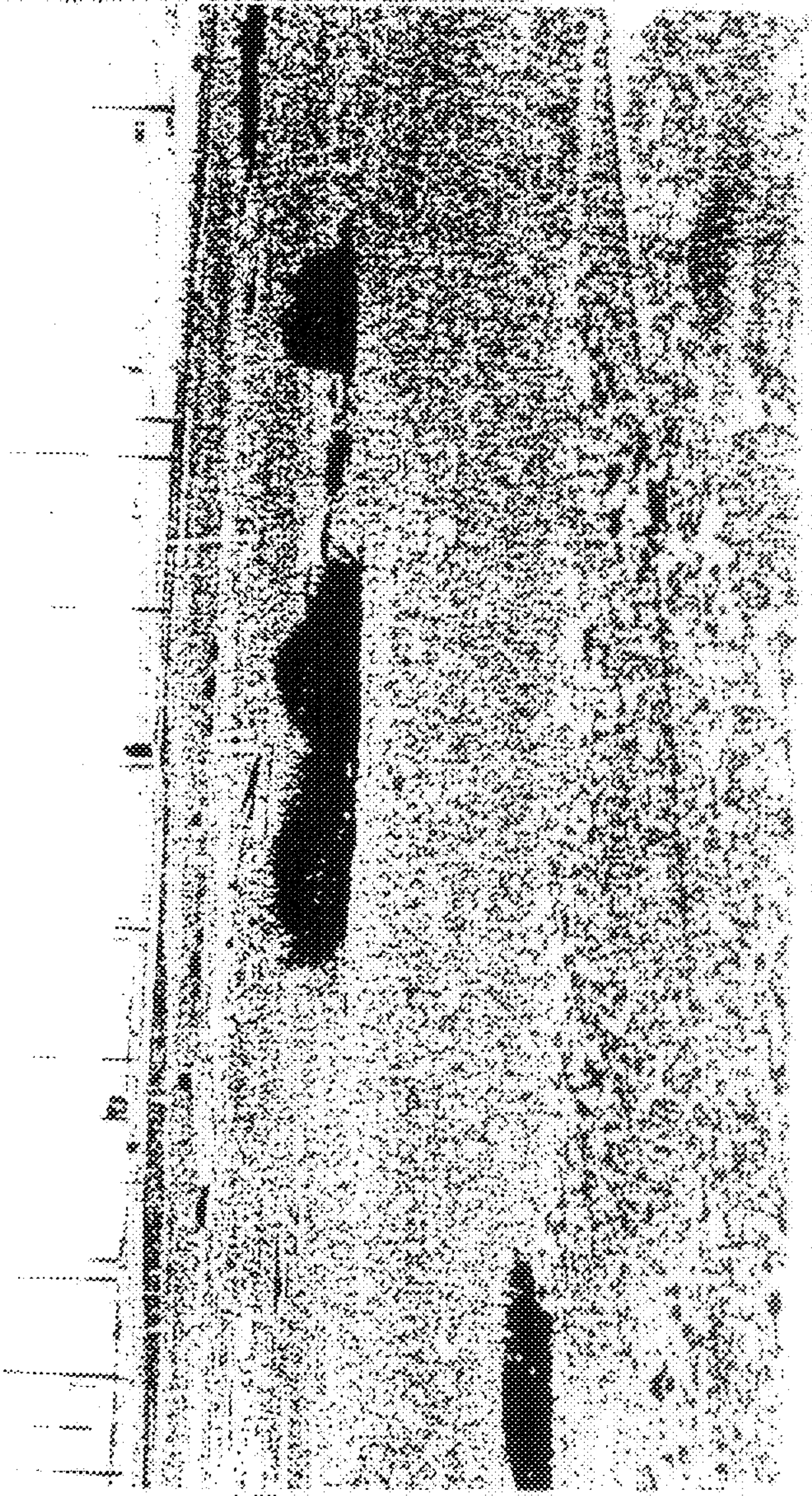
Photograph A-12. 241-B, 241-BX, and 241-BY Tank Farms.



Photograph A-13. 216-B-7A and 216-B-7B Cribs

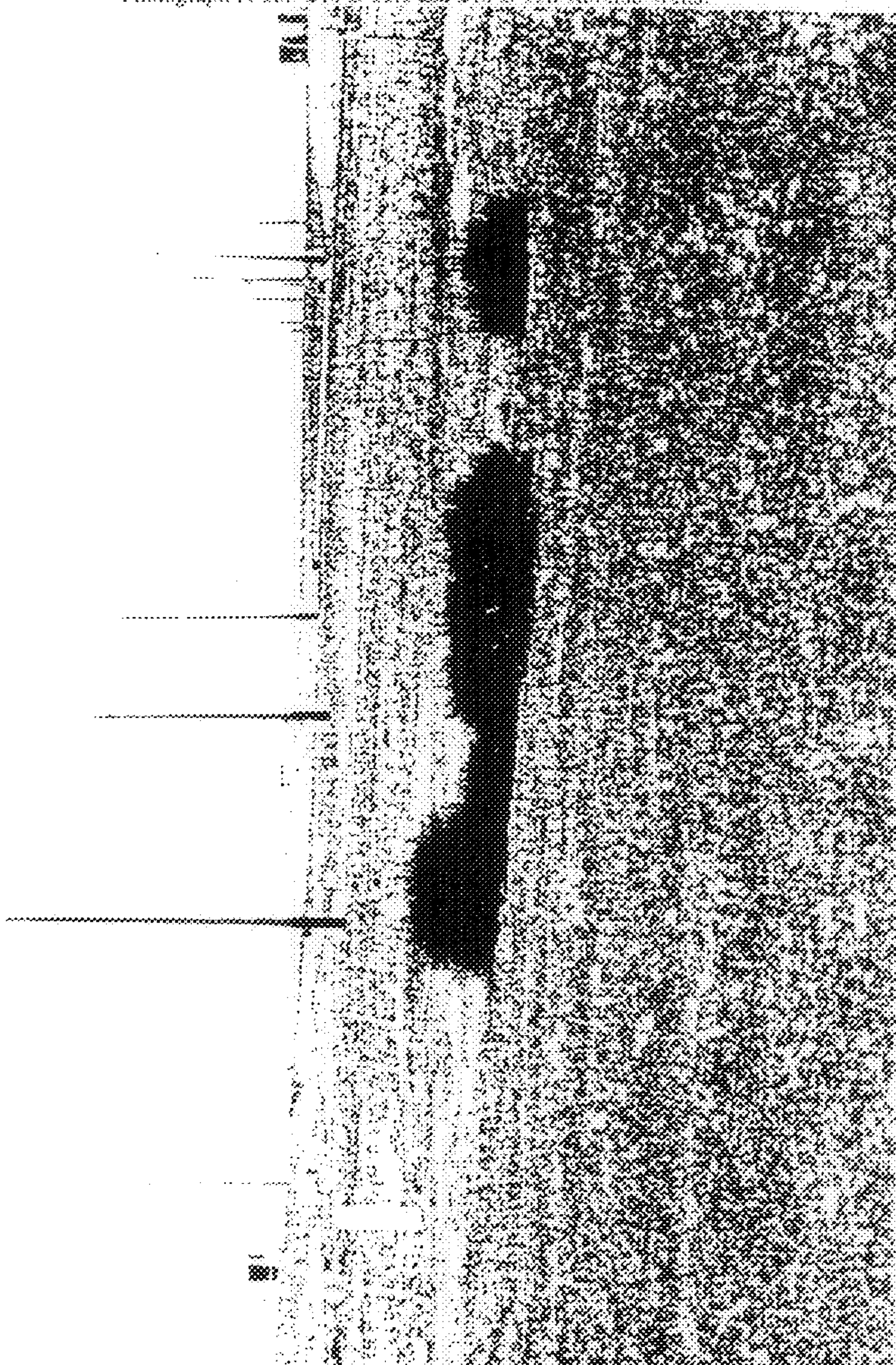


Photograph A-14. 216-B-8TF Crib and Tile Field

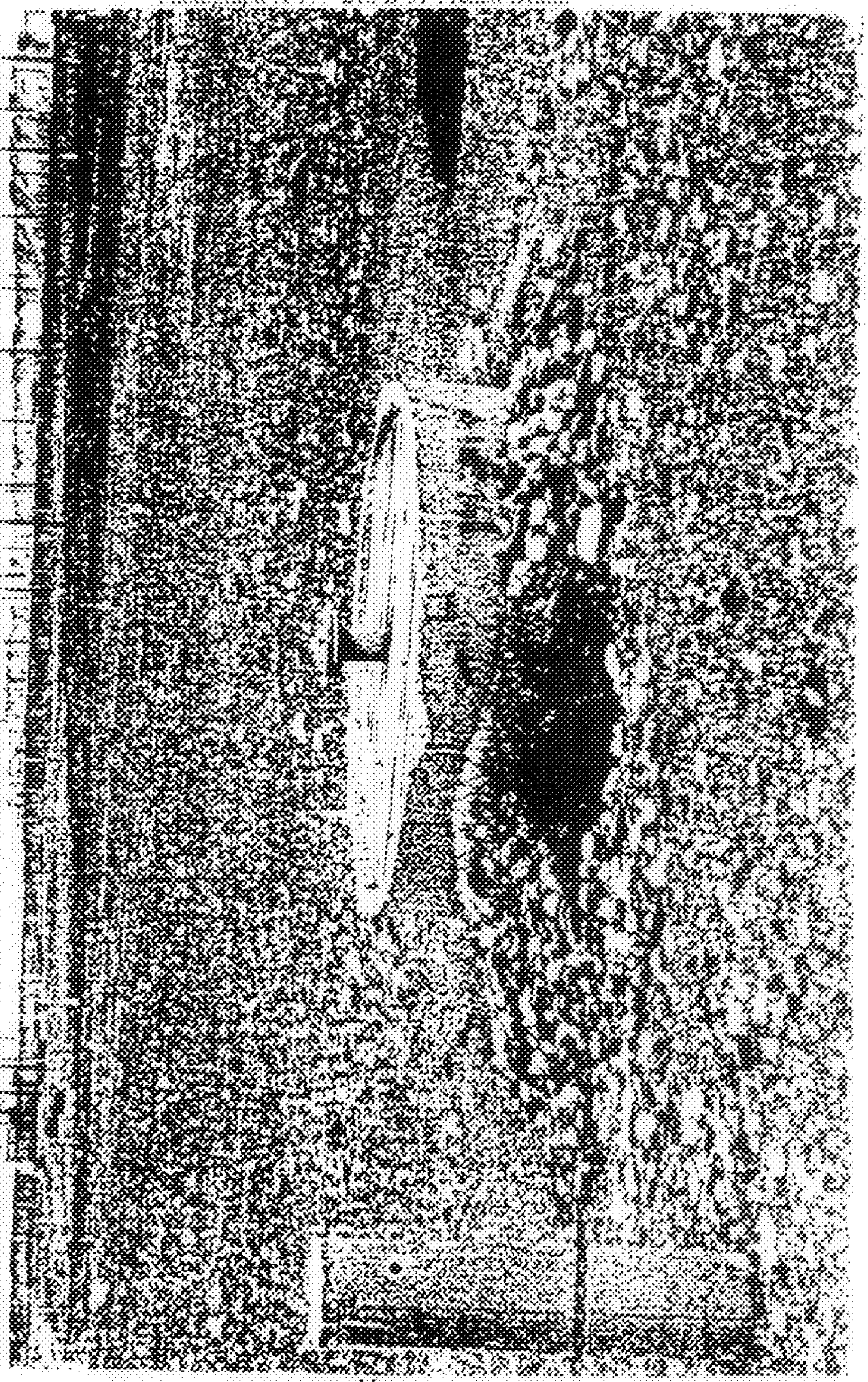


Photograph A-13. 216-B-8TF Crib and Tile Field (near current conditions)

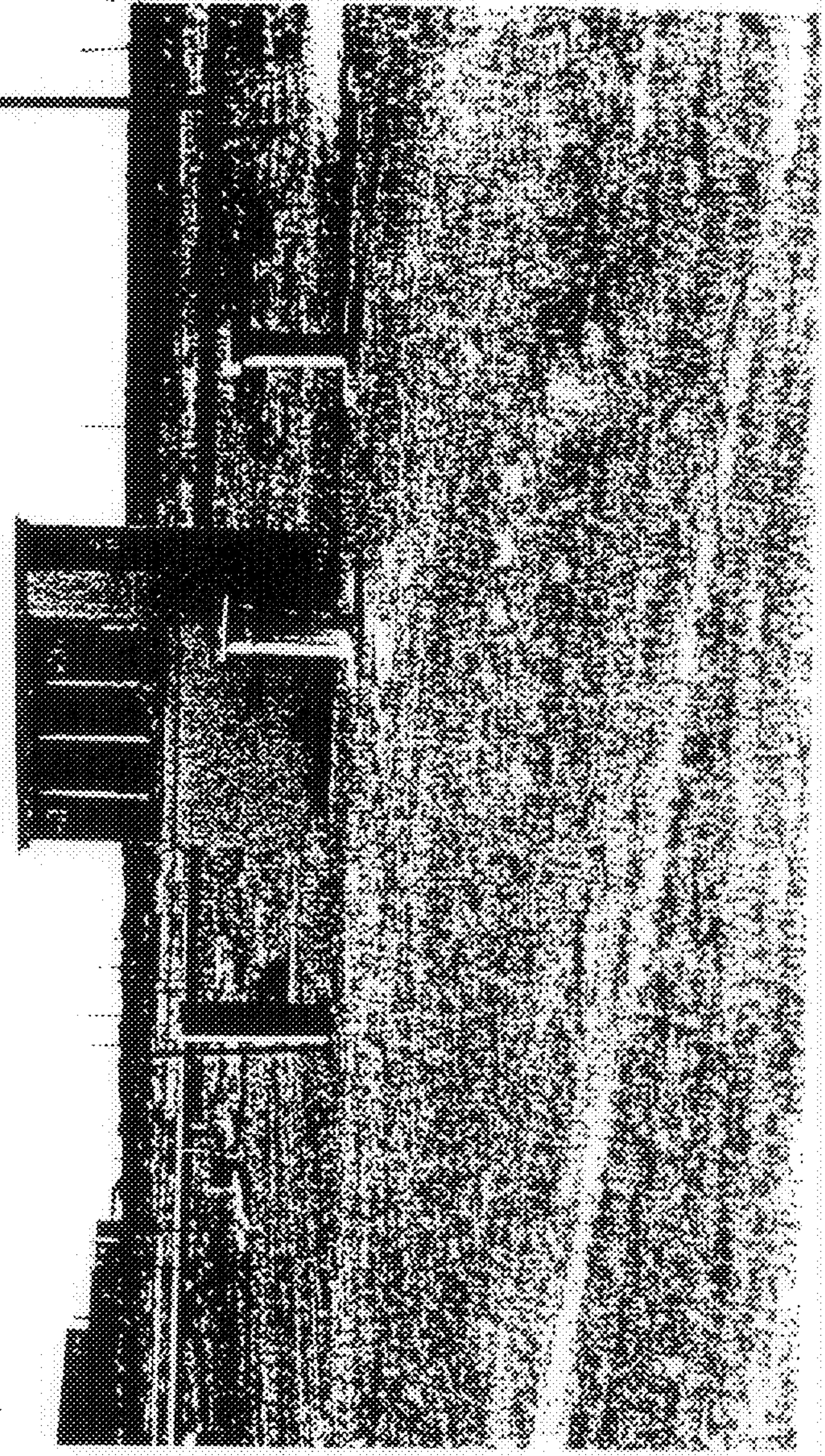
Photograph A-16. 216-B-11A and 216-B-11B Reverse Wells.



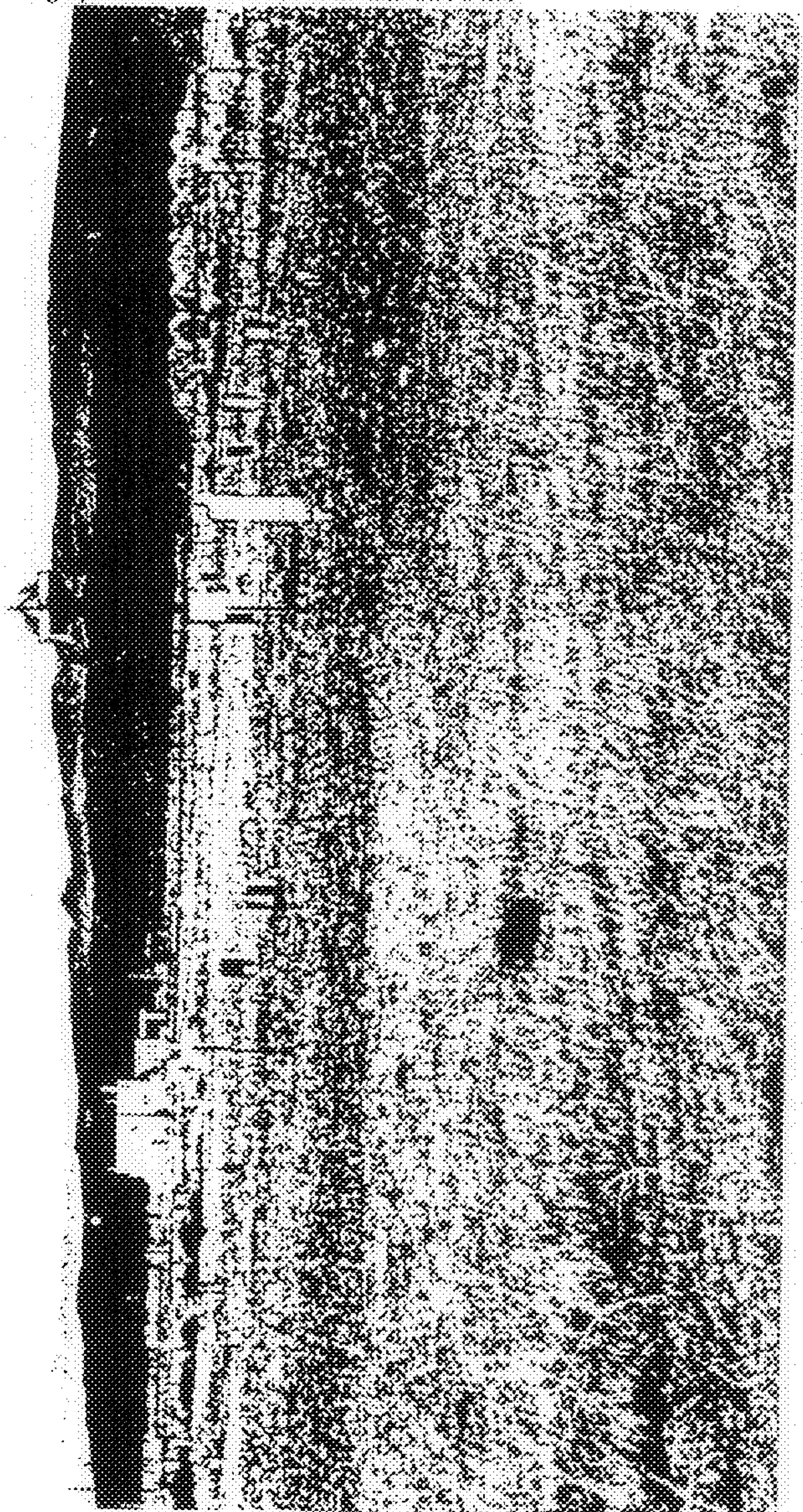
Photograph A-17. 216-B-51 French Drain.



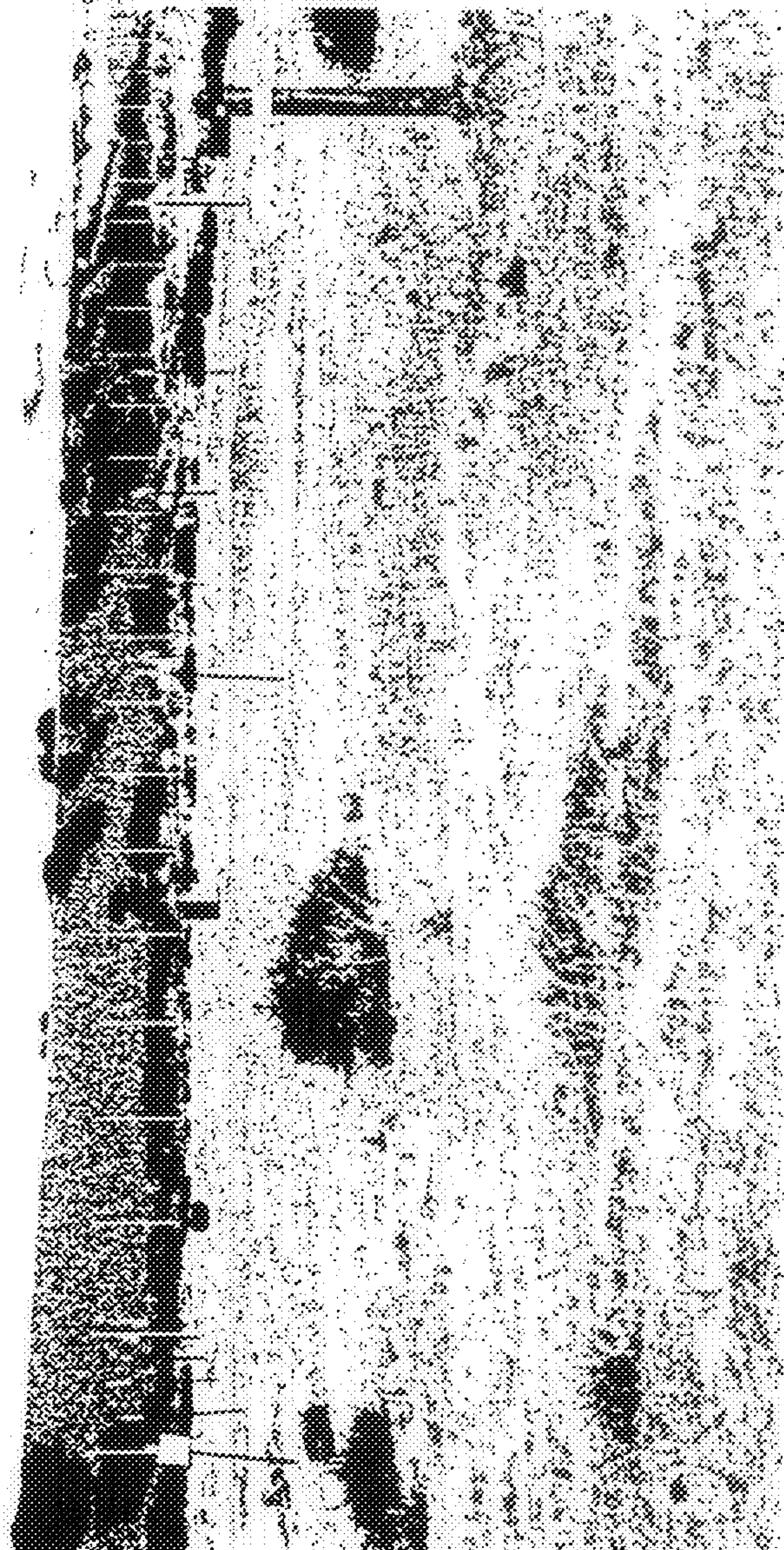
Photograph A-18. 216-B-5 Reverse Well.



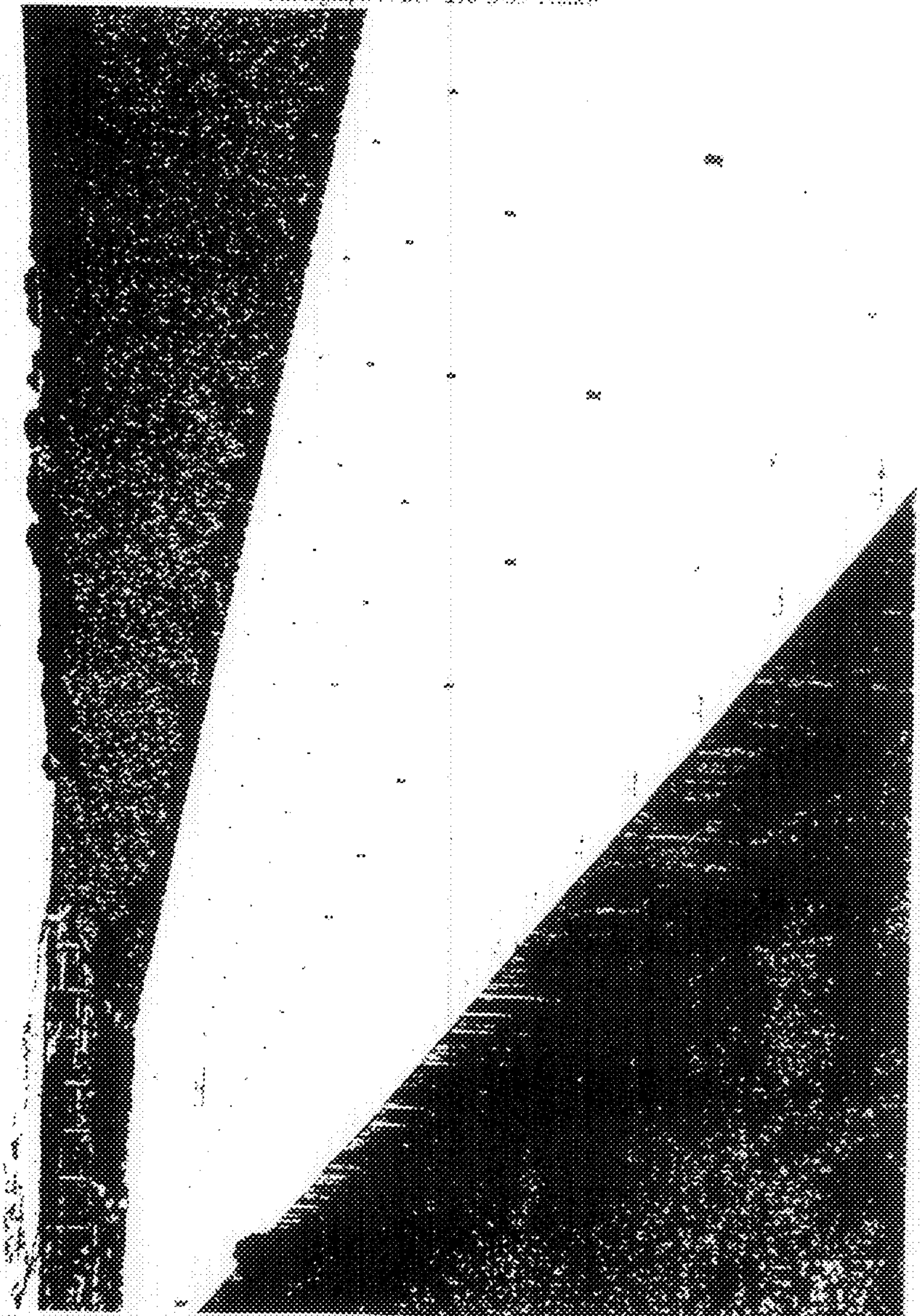
Photograph A-19. 216-B-9TF Crib and Tile Field



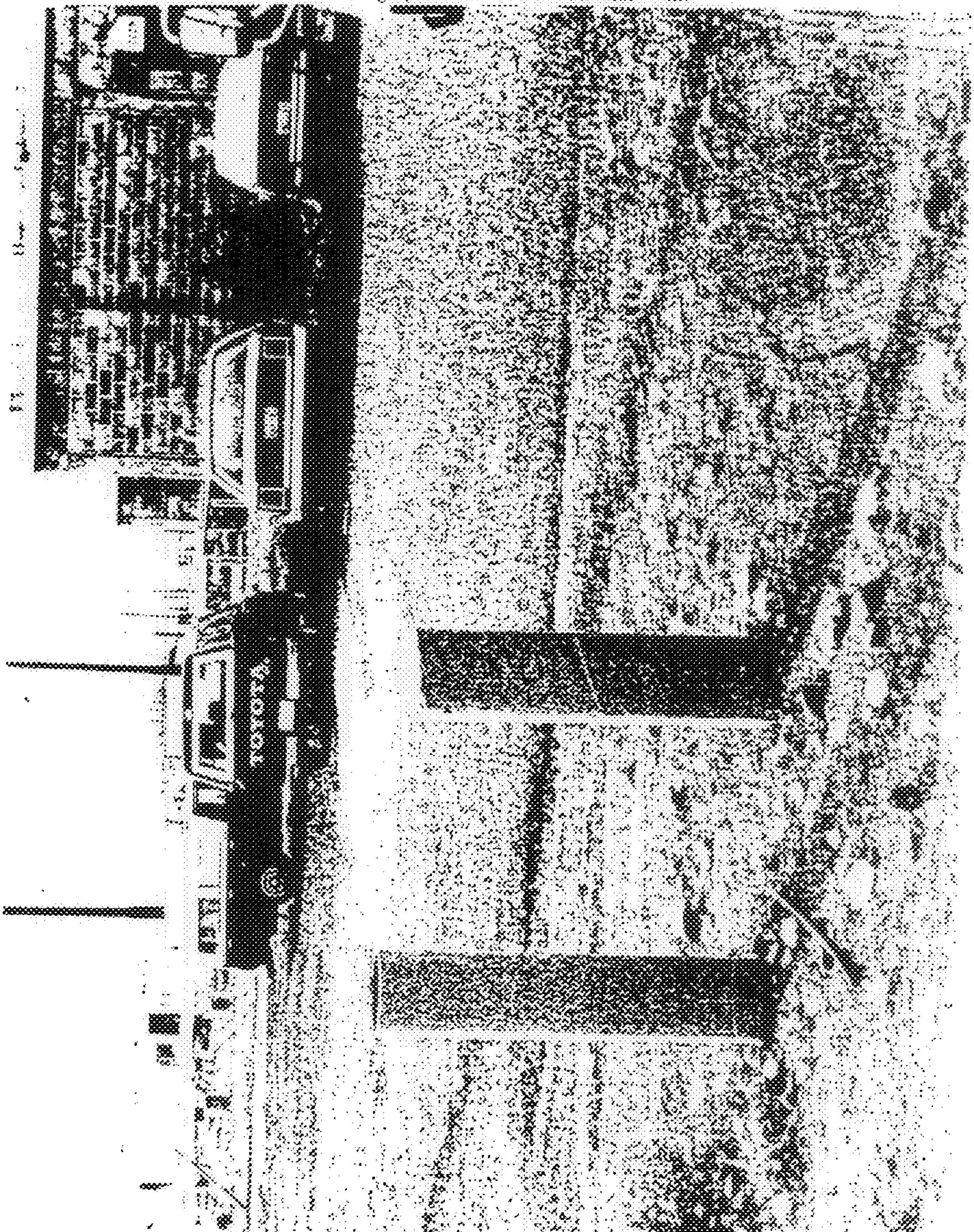
Photograph A-20. 216-B-56 Crib.



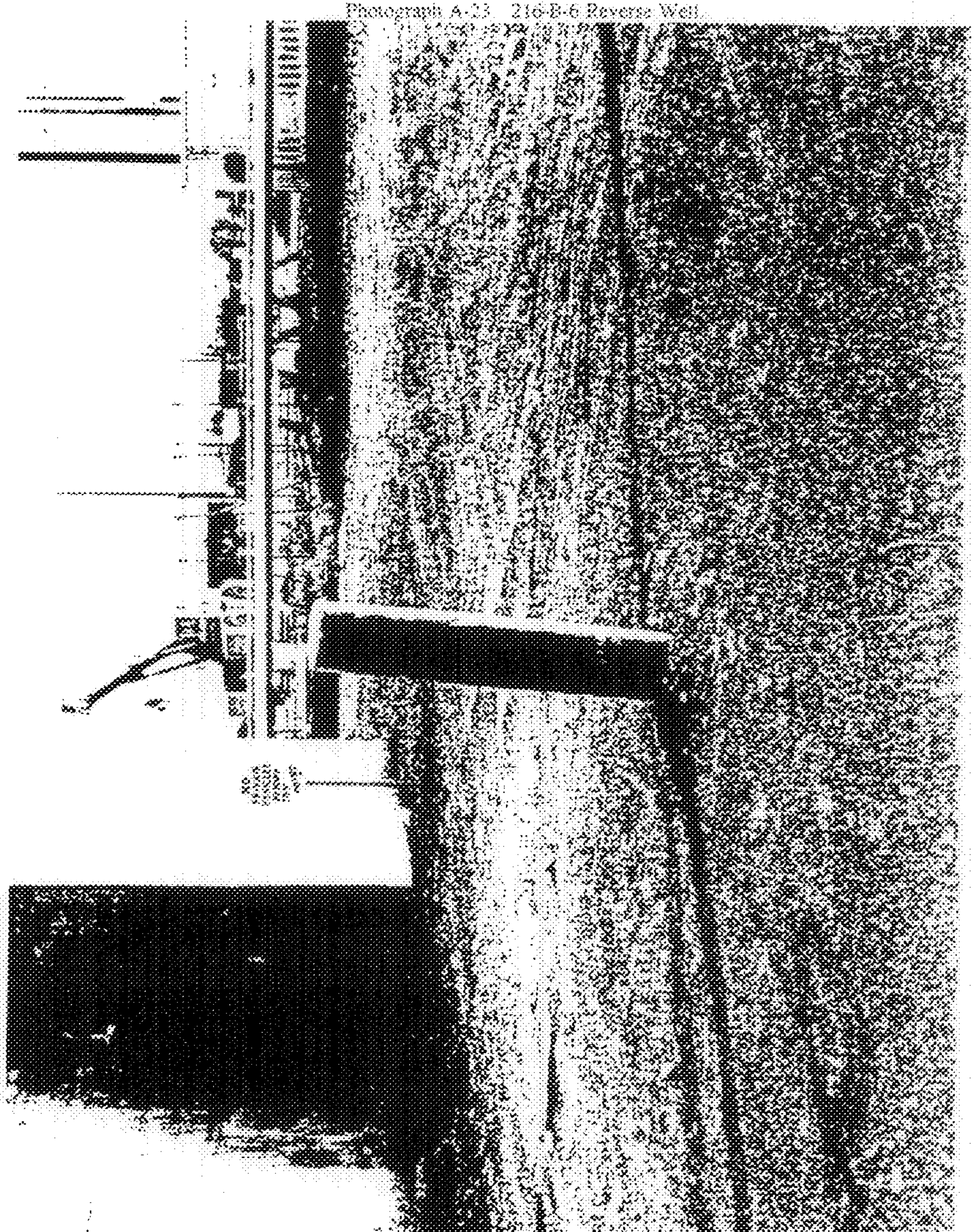
Photograph A-21. 216-B-59 Trench



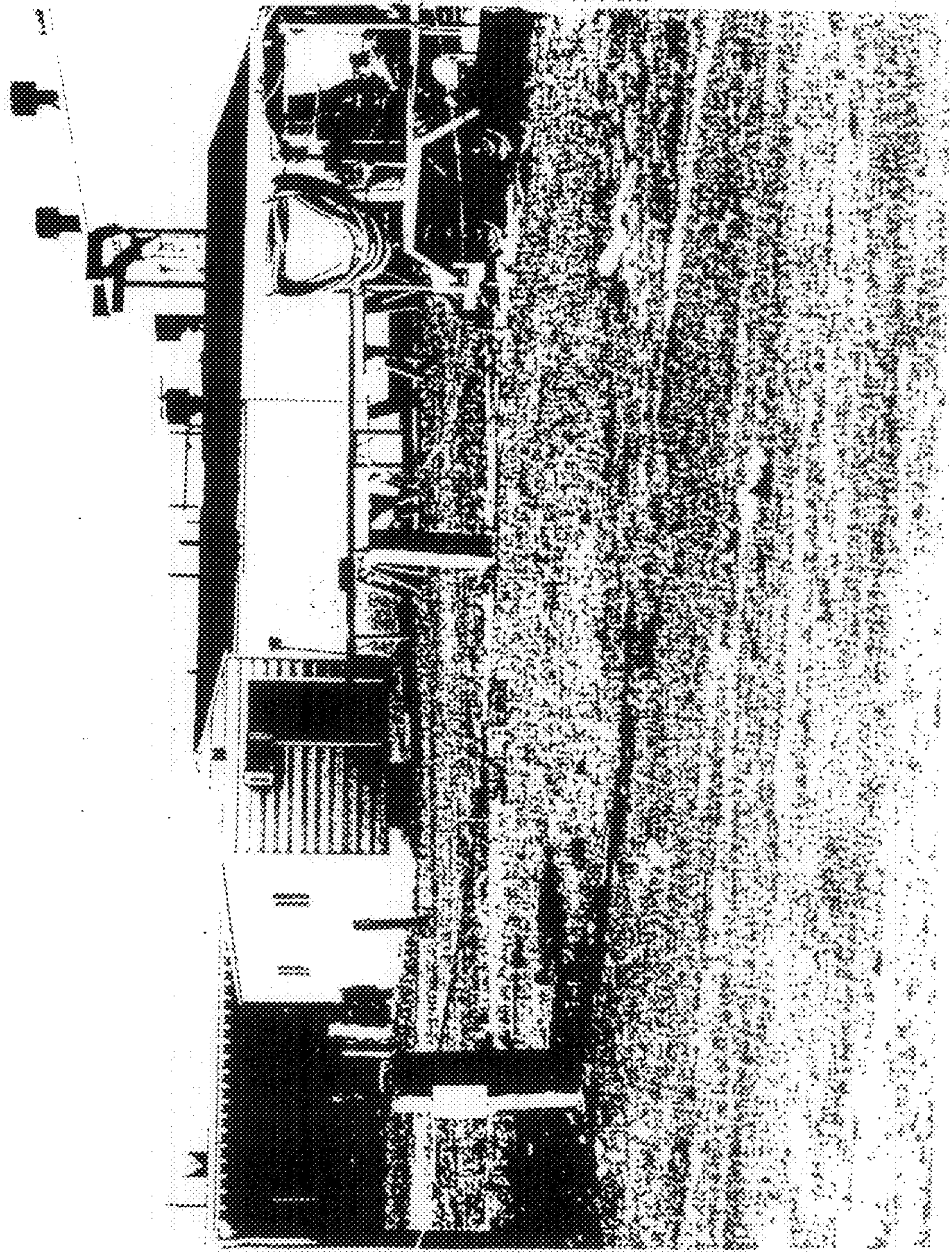
Photograph A-22. 216-B-4 Reverse Well.



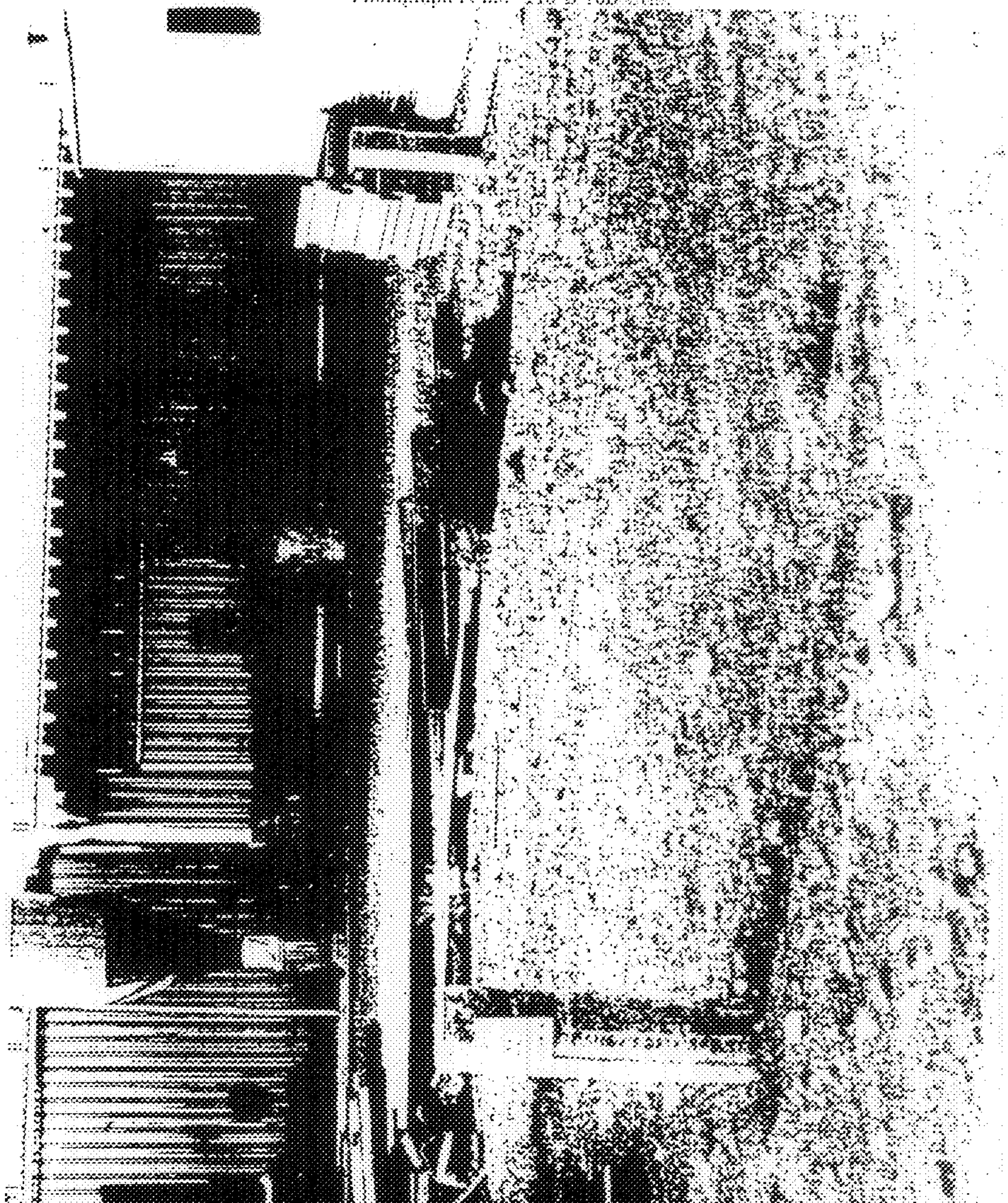
Photograph A-23. 216-B-6 Reverse Well.



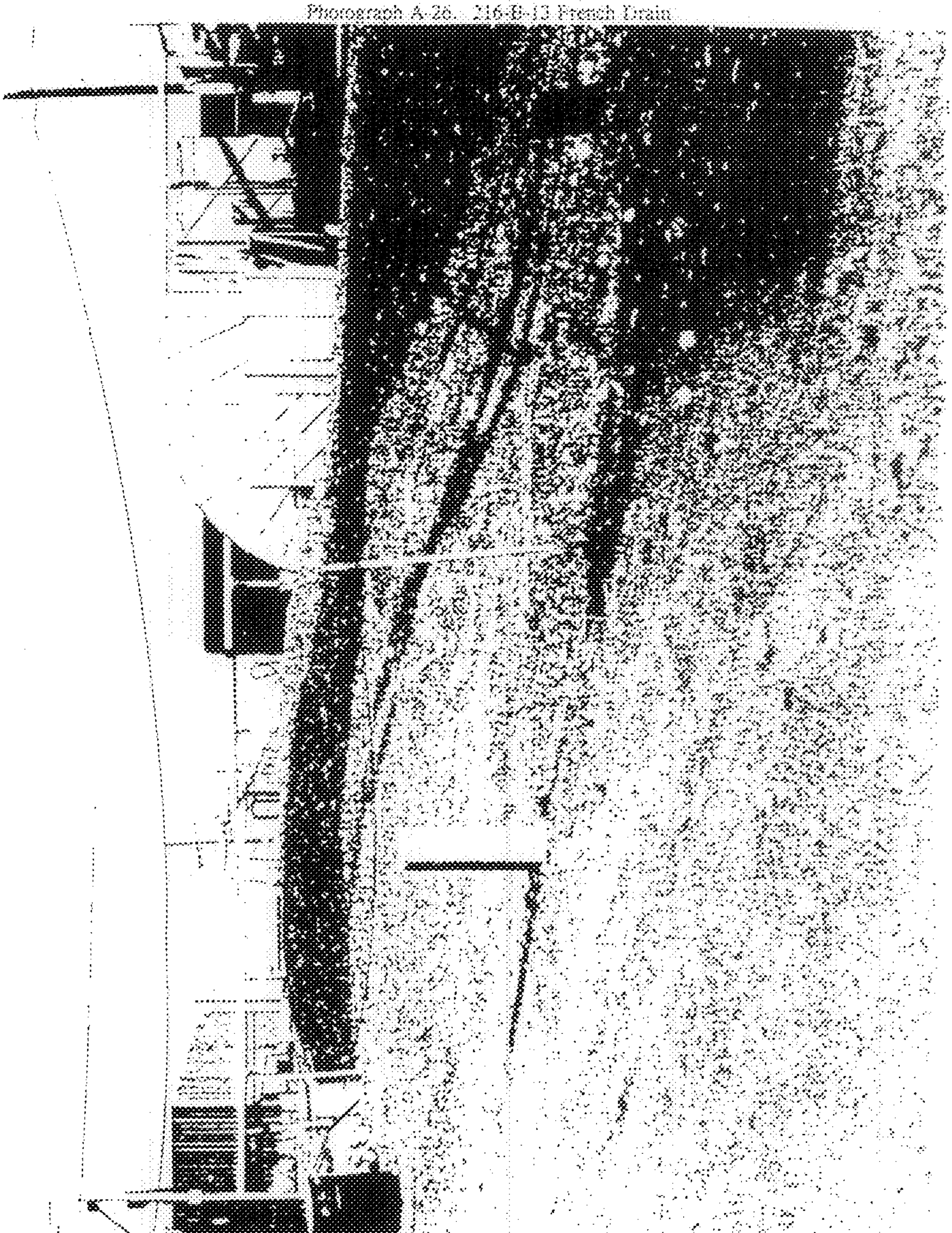
Photograph A-24. 116-B-10A Crib.



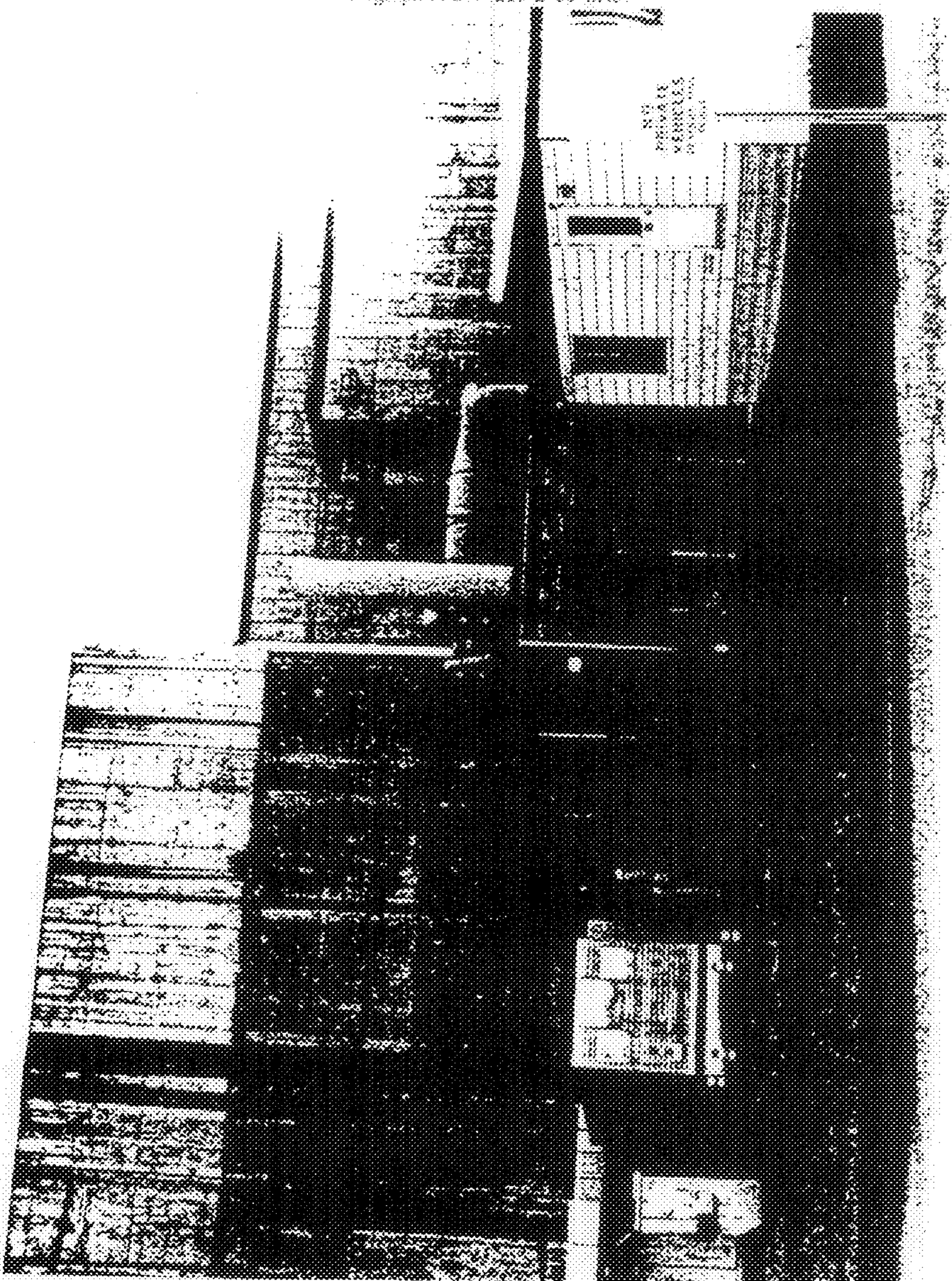
Photograph A-25. 216-B-10B Crib.



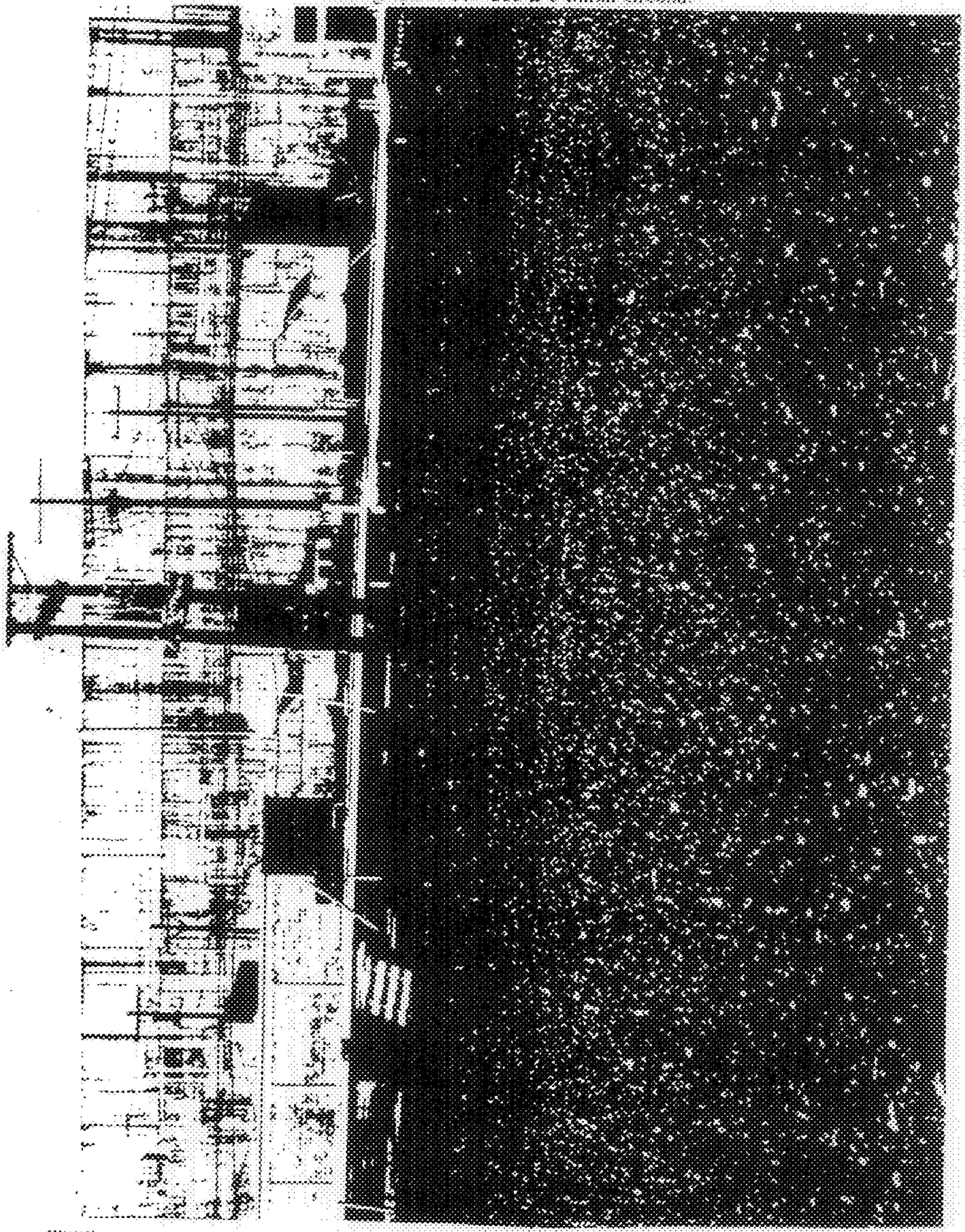
Photograph A-26. 216-B-13 French Drain



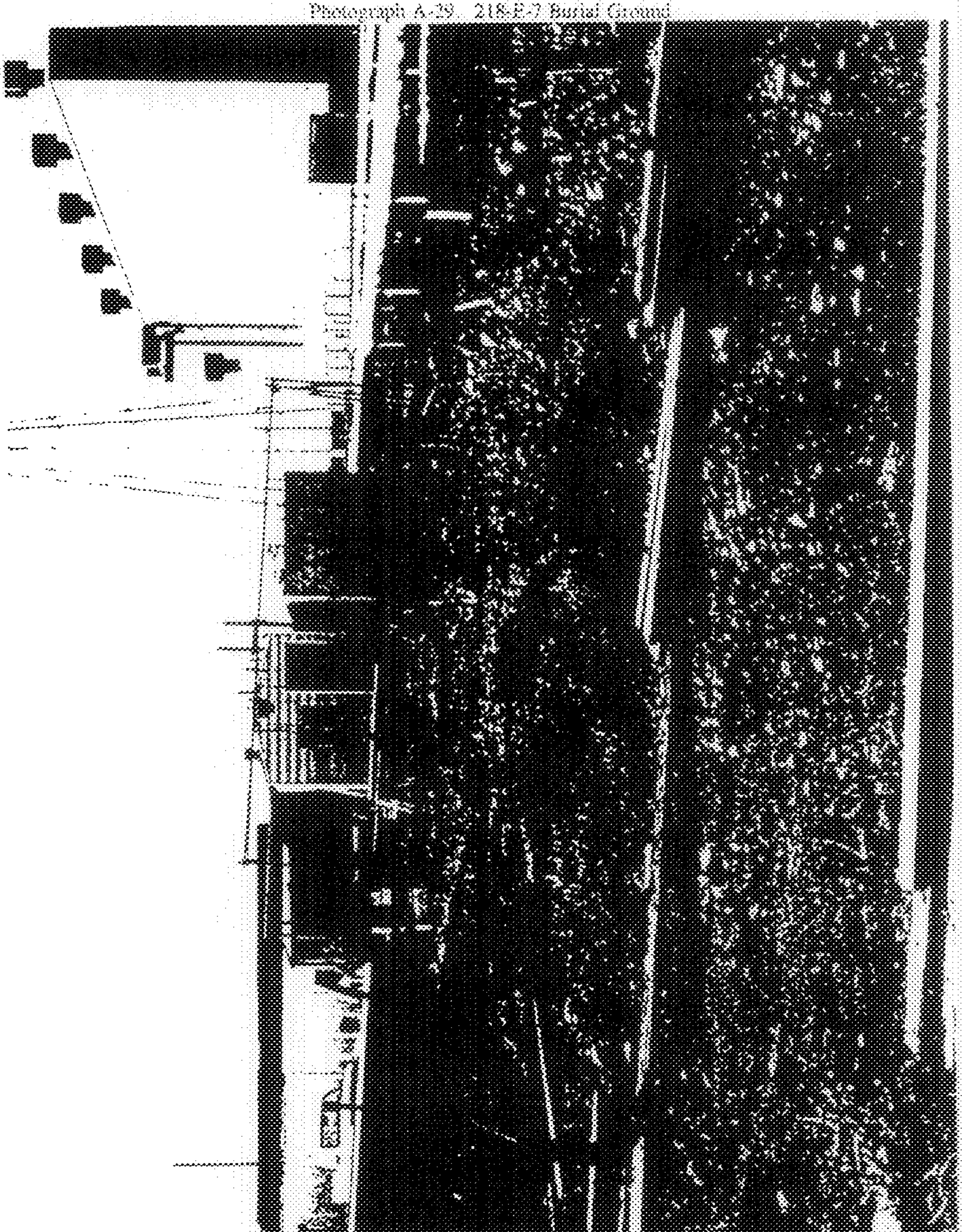
Photograph A-27. 216-B-60 Crib.

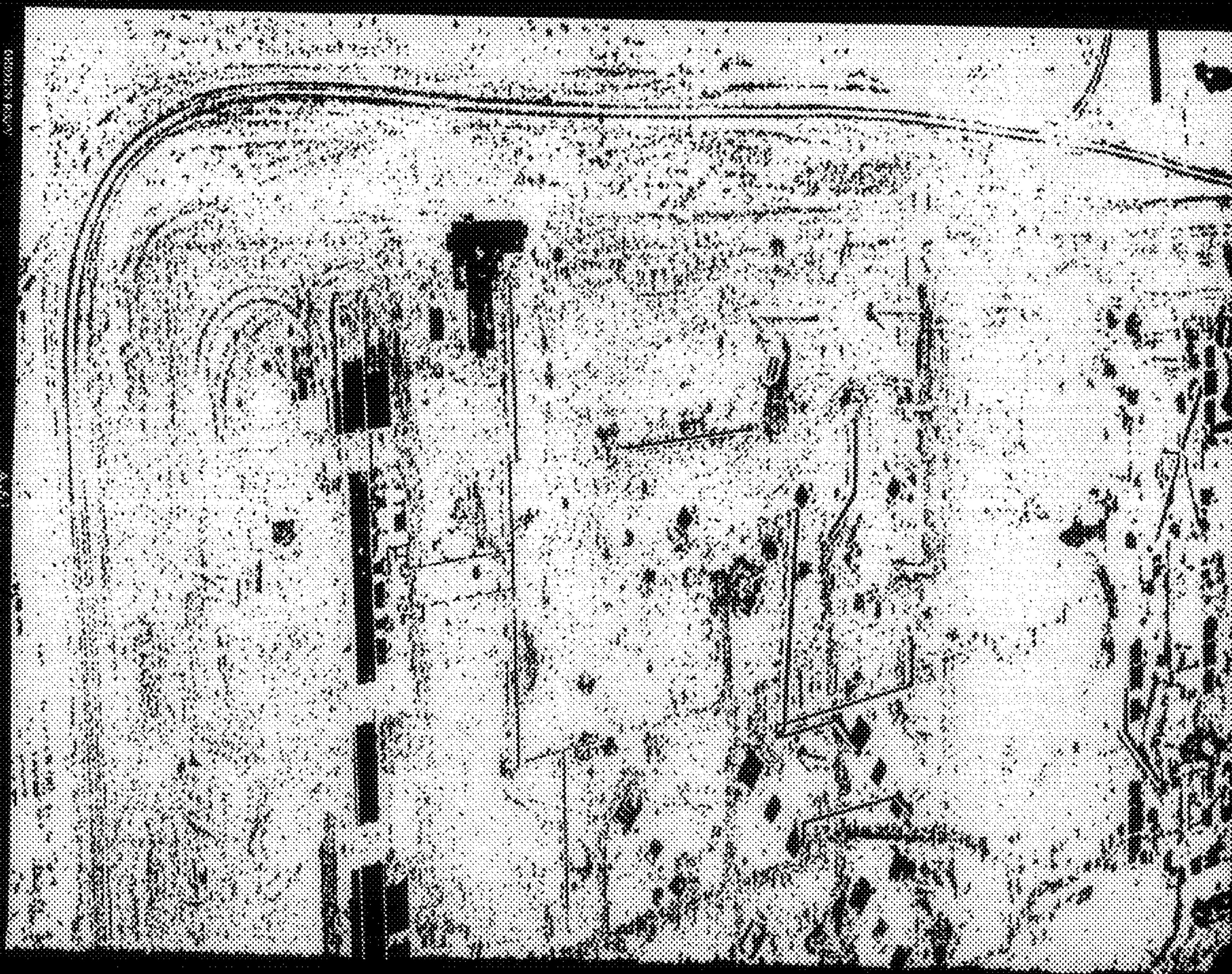


Photograph A-28. 218-E-6 Burial Ground.

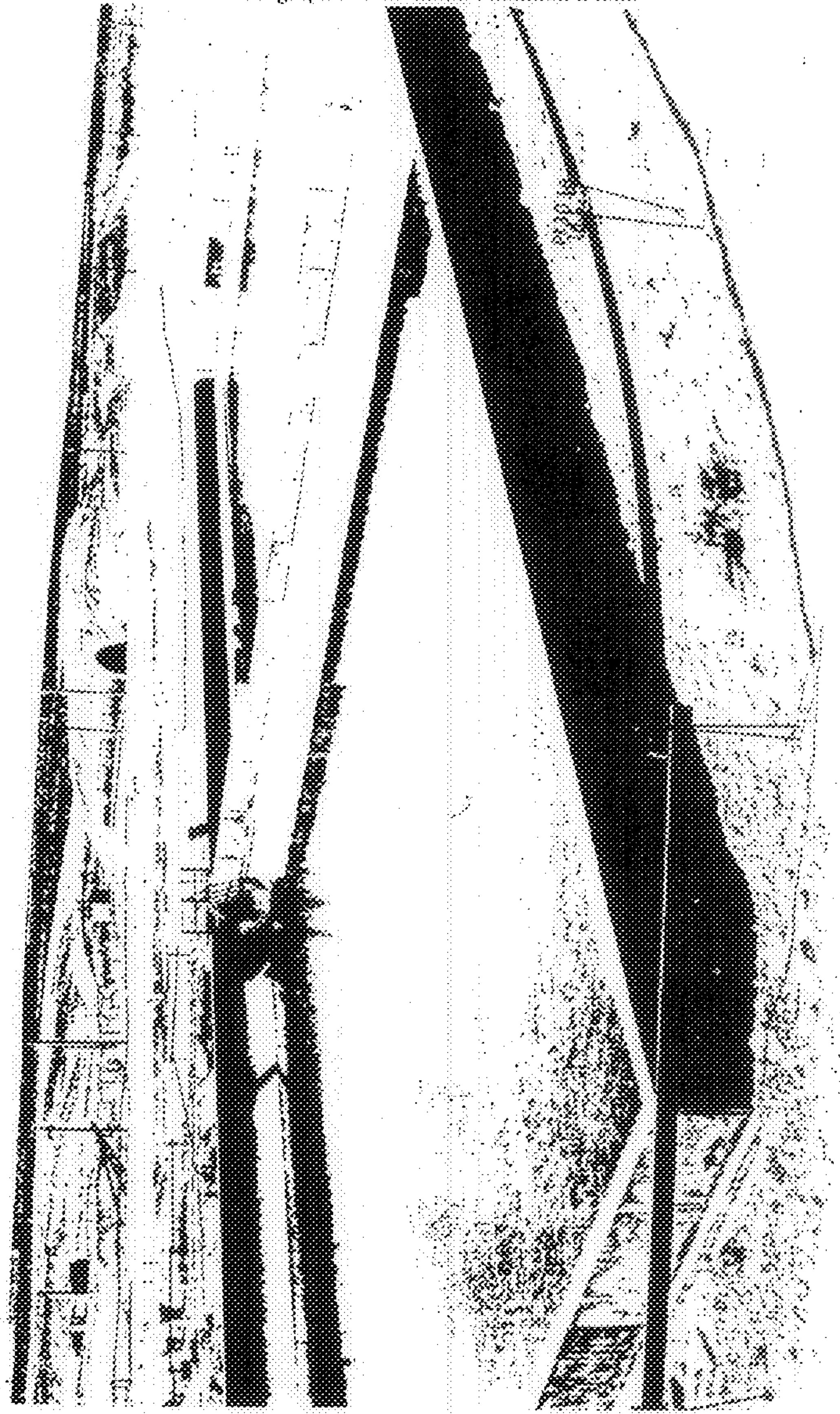


Photograph A-29. 218-E-7 Burial Ground

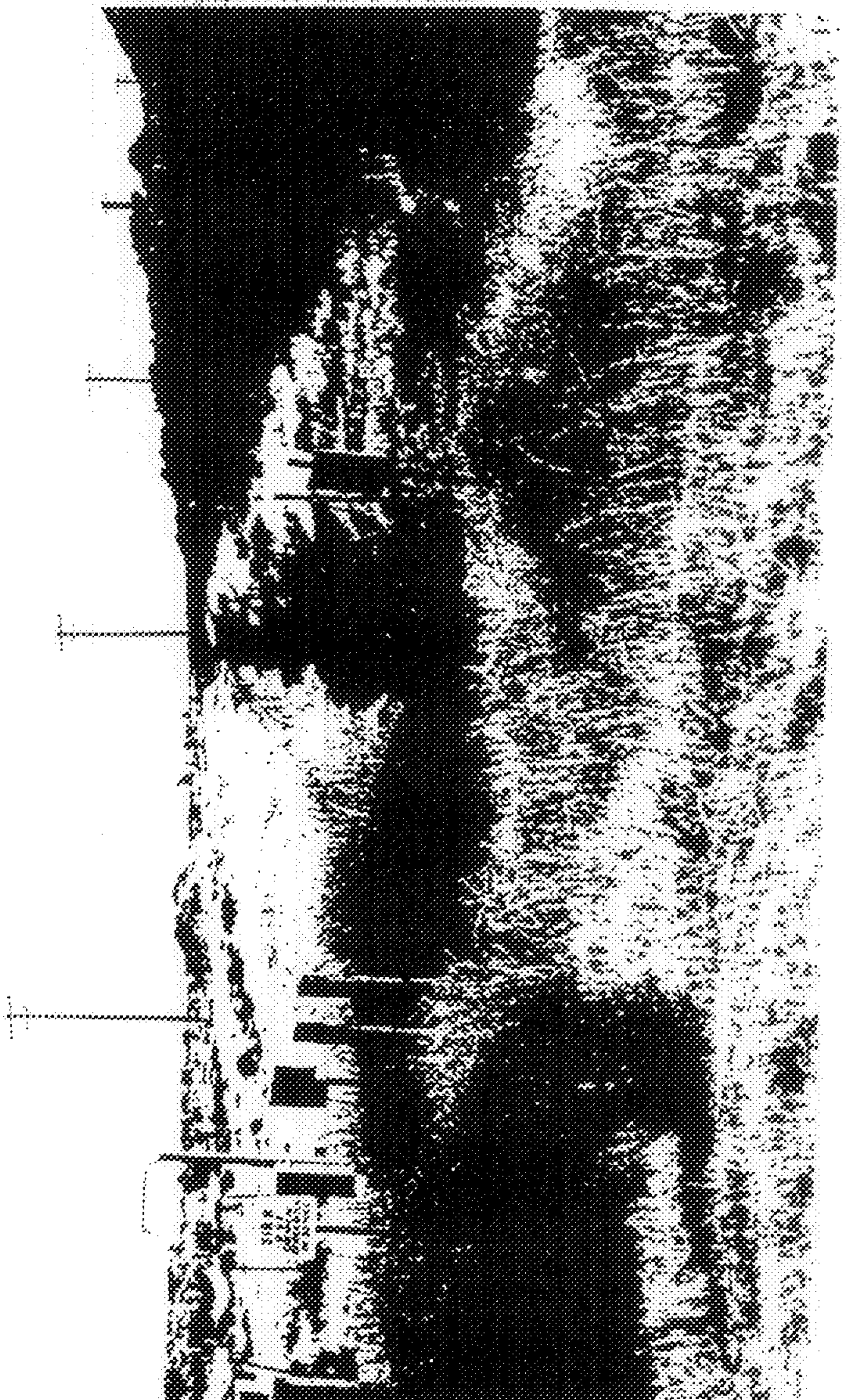




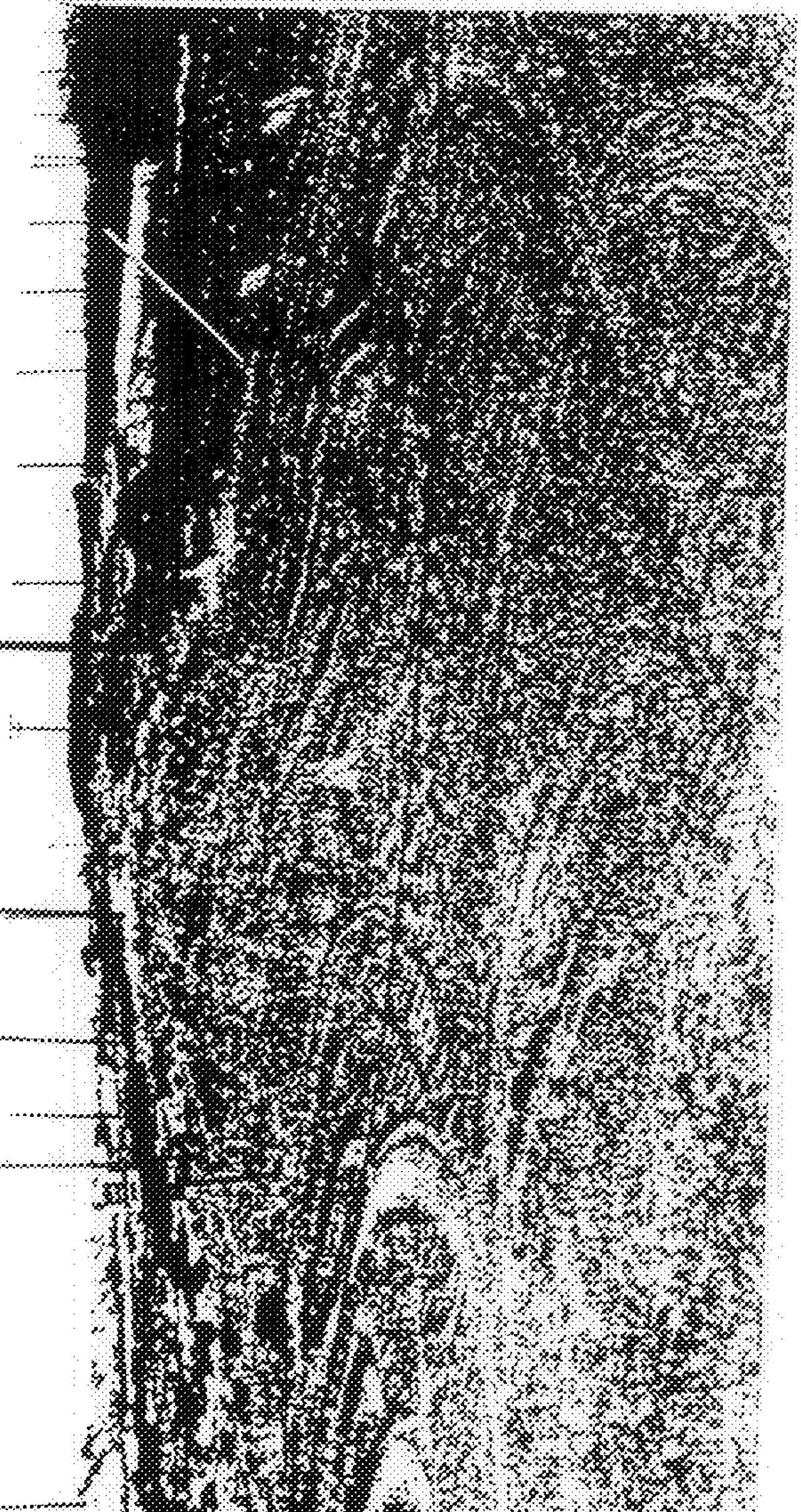
Photograph A-31. 207-B Retention Basin.



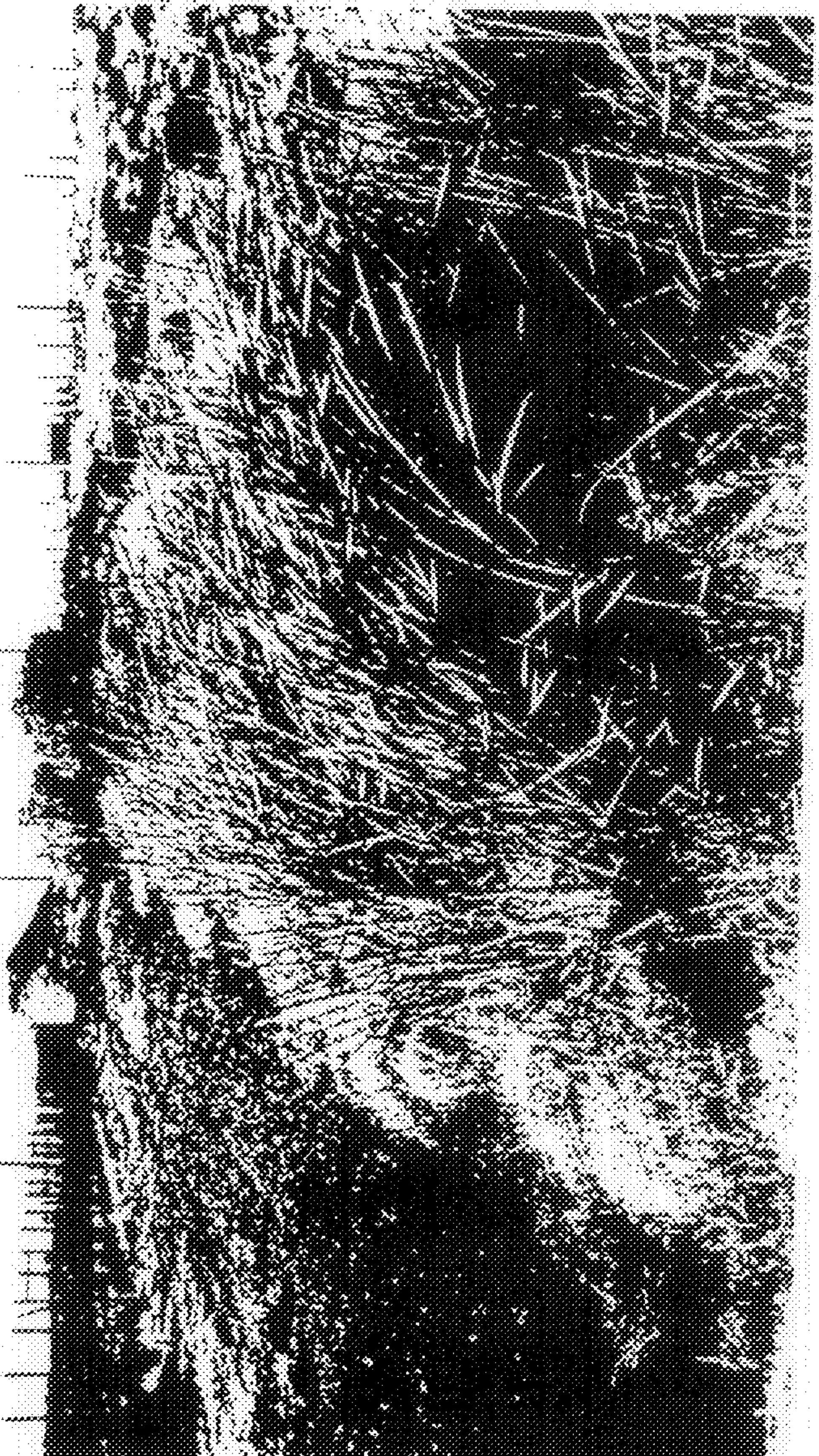
Photograph A-32. 216-B-63 Ditch.



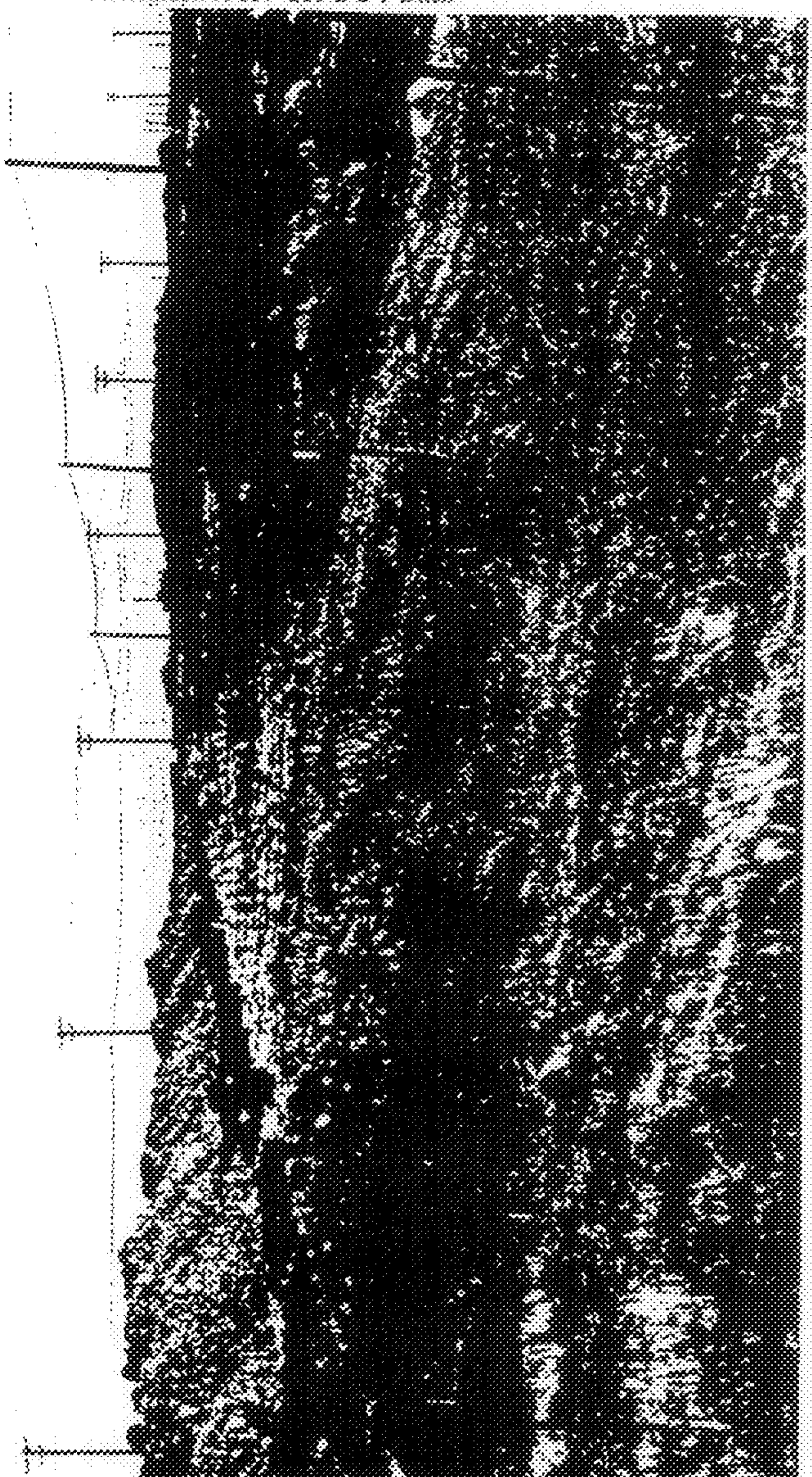
Photograph A-33. 216-B-2-2 Ditch.



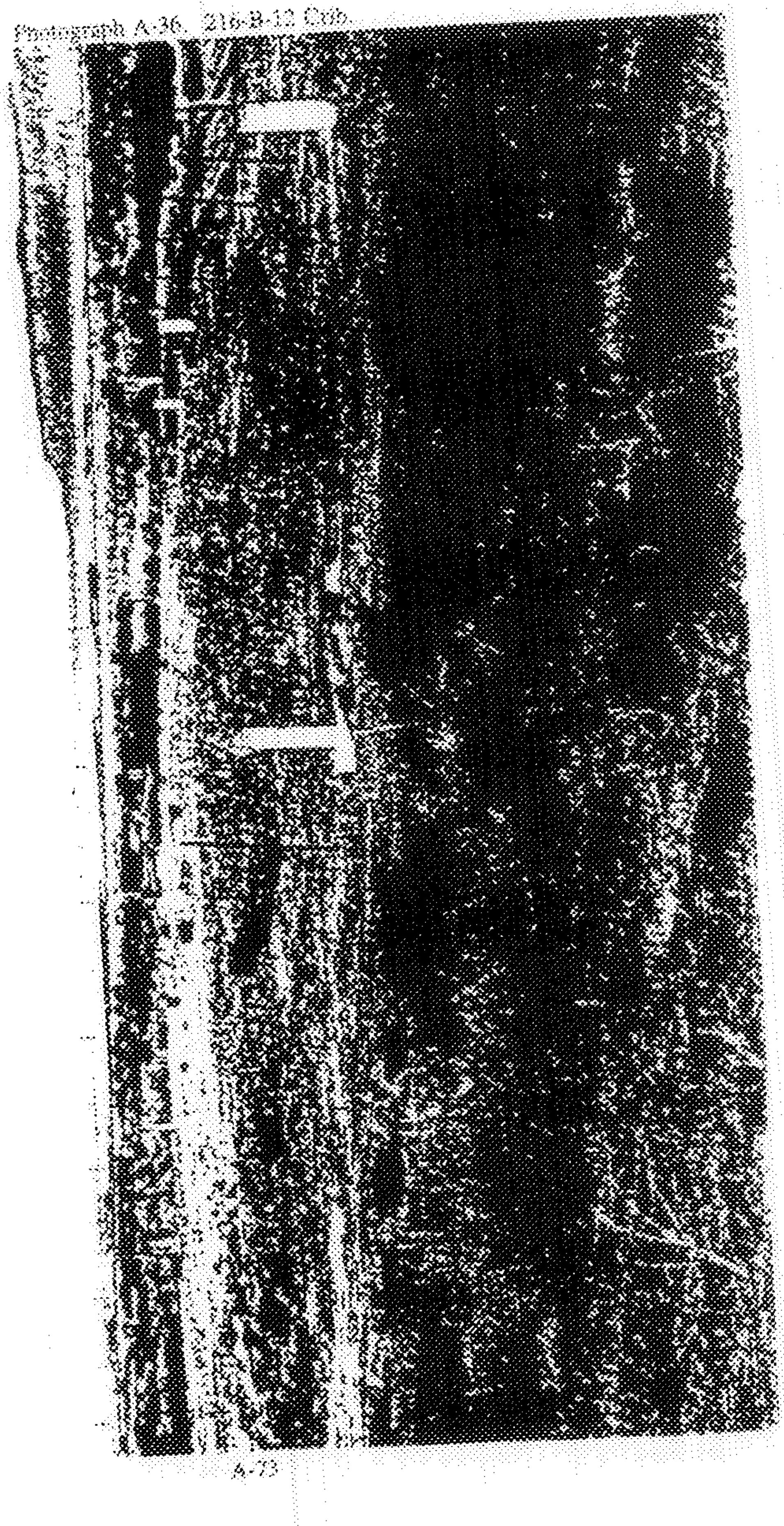
Photograph A-34. 216-B-2-3 Ditch.



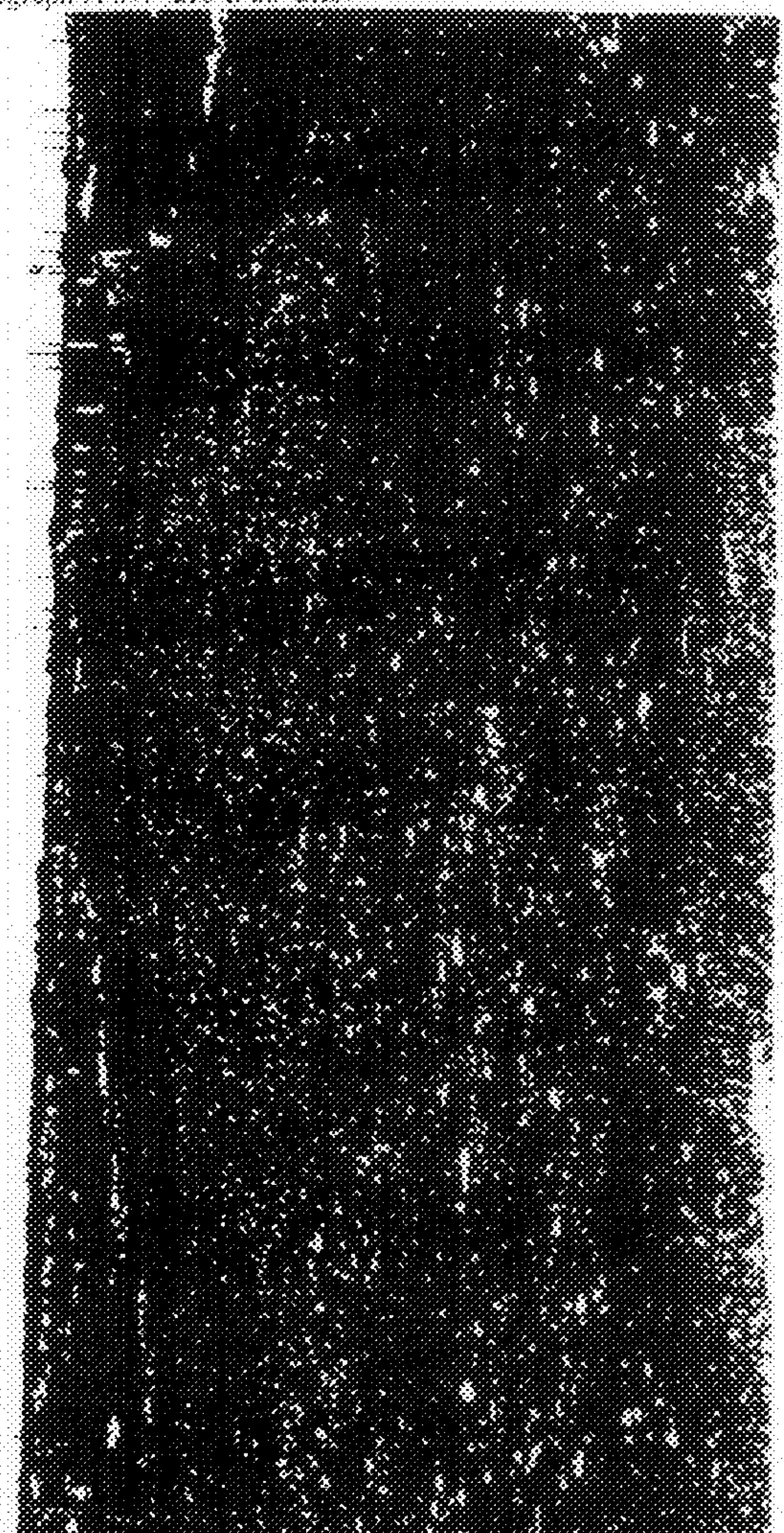
Photograph A-35. 216-B-2-1 Ditch



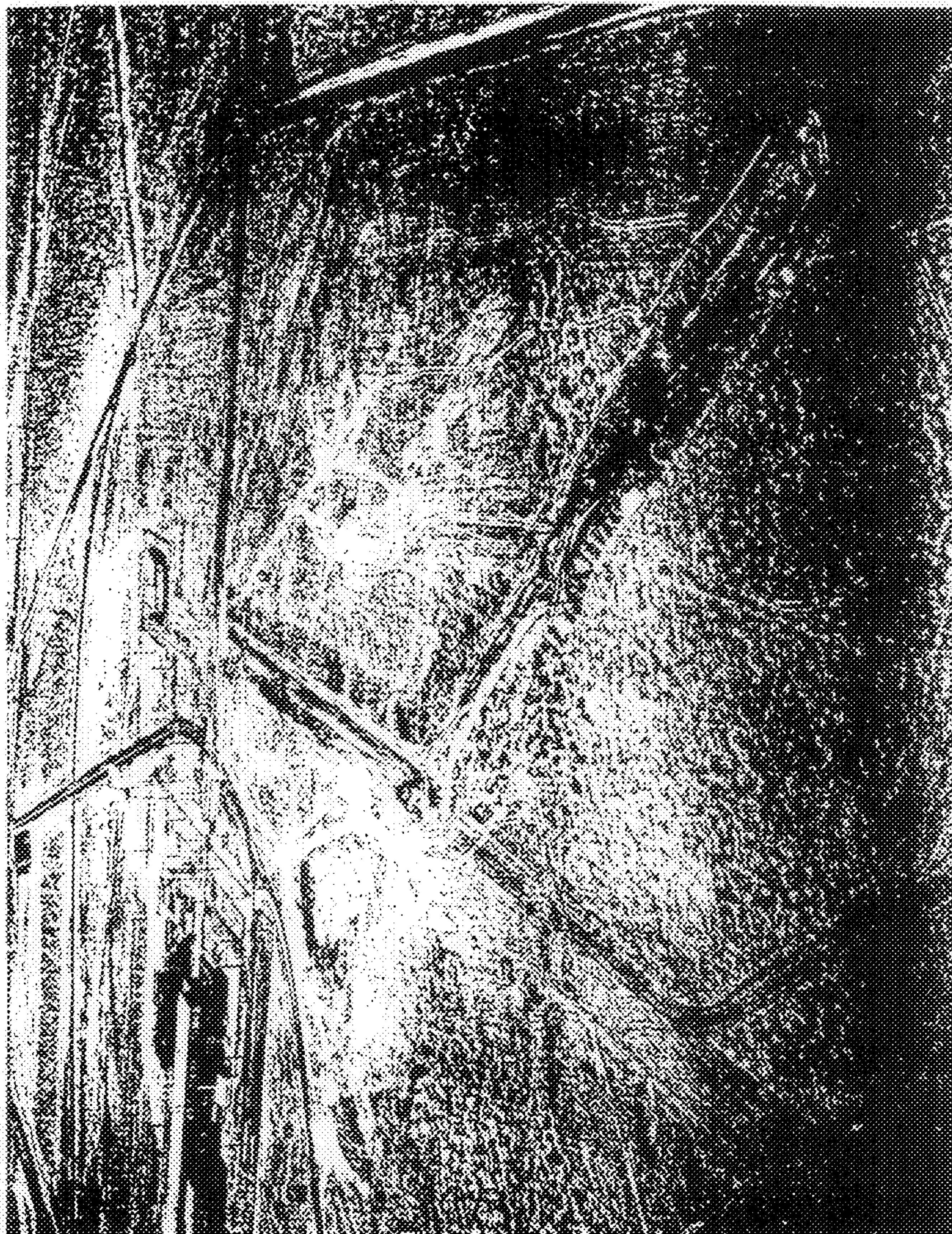
Photograph A-36. 216-B-12 Crib.



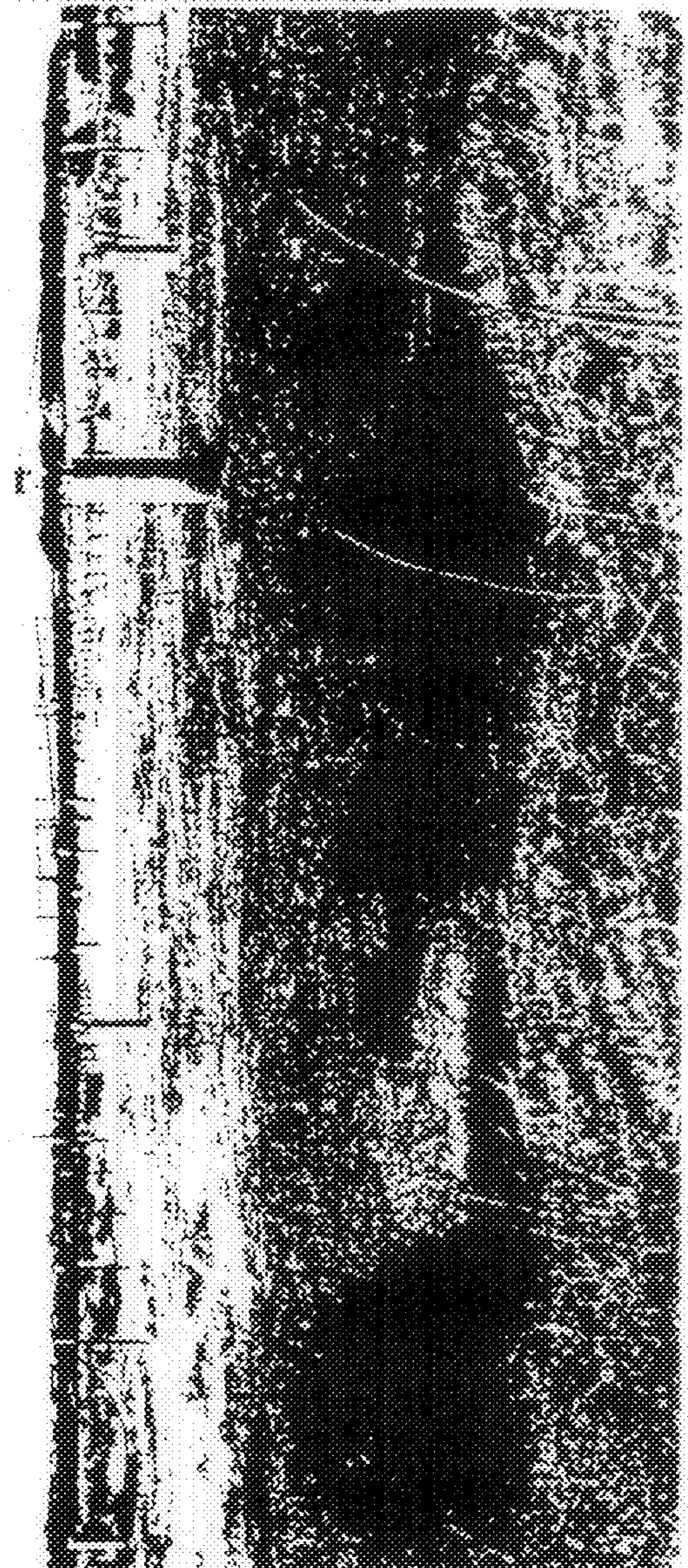
Photograph A-37. 216-B-55 Crib.



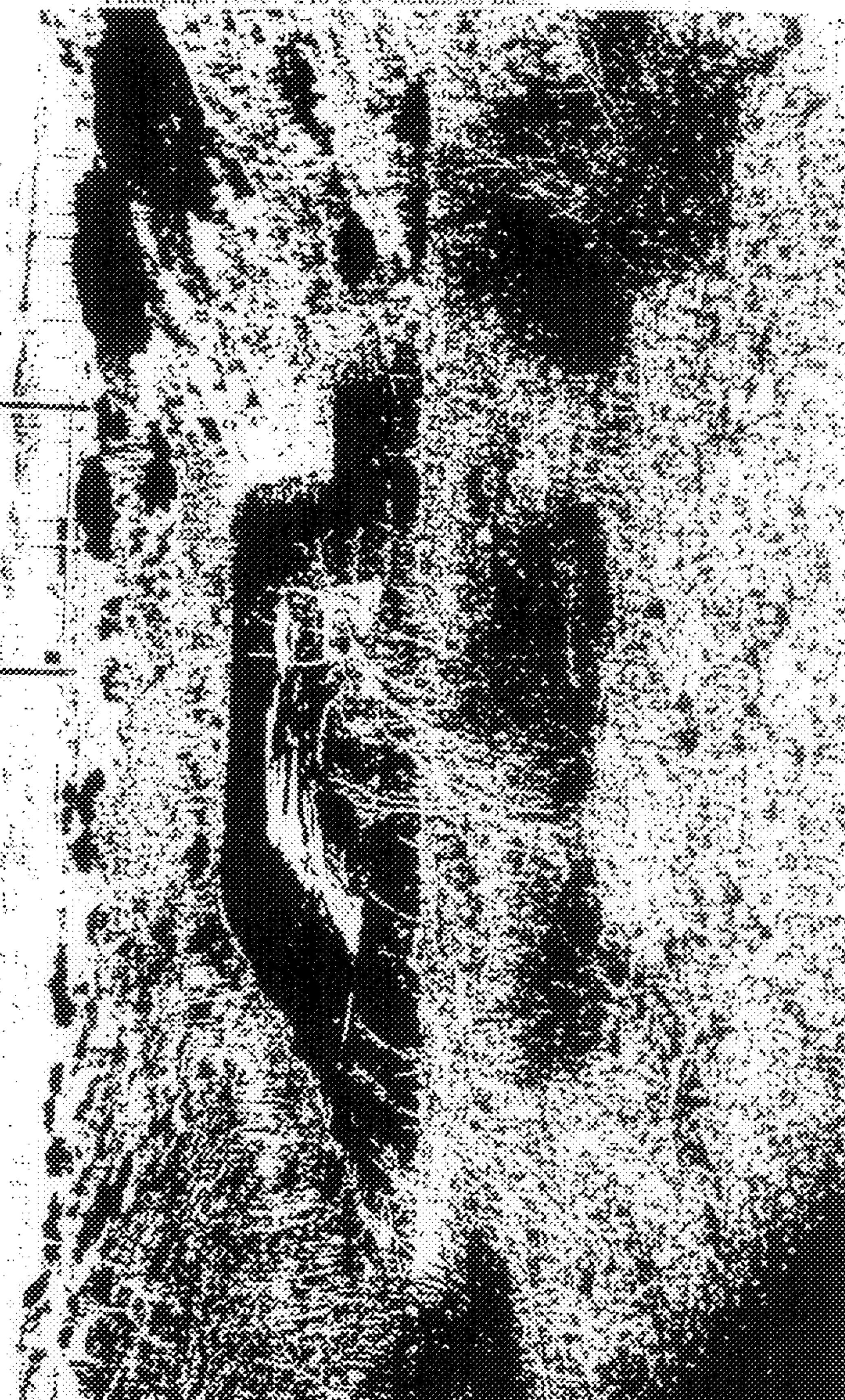
Photograph A-38. 216-B-62 Crib



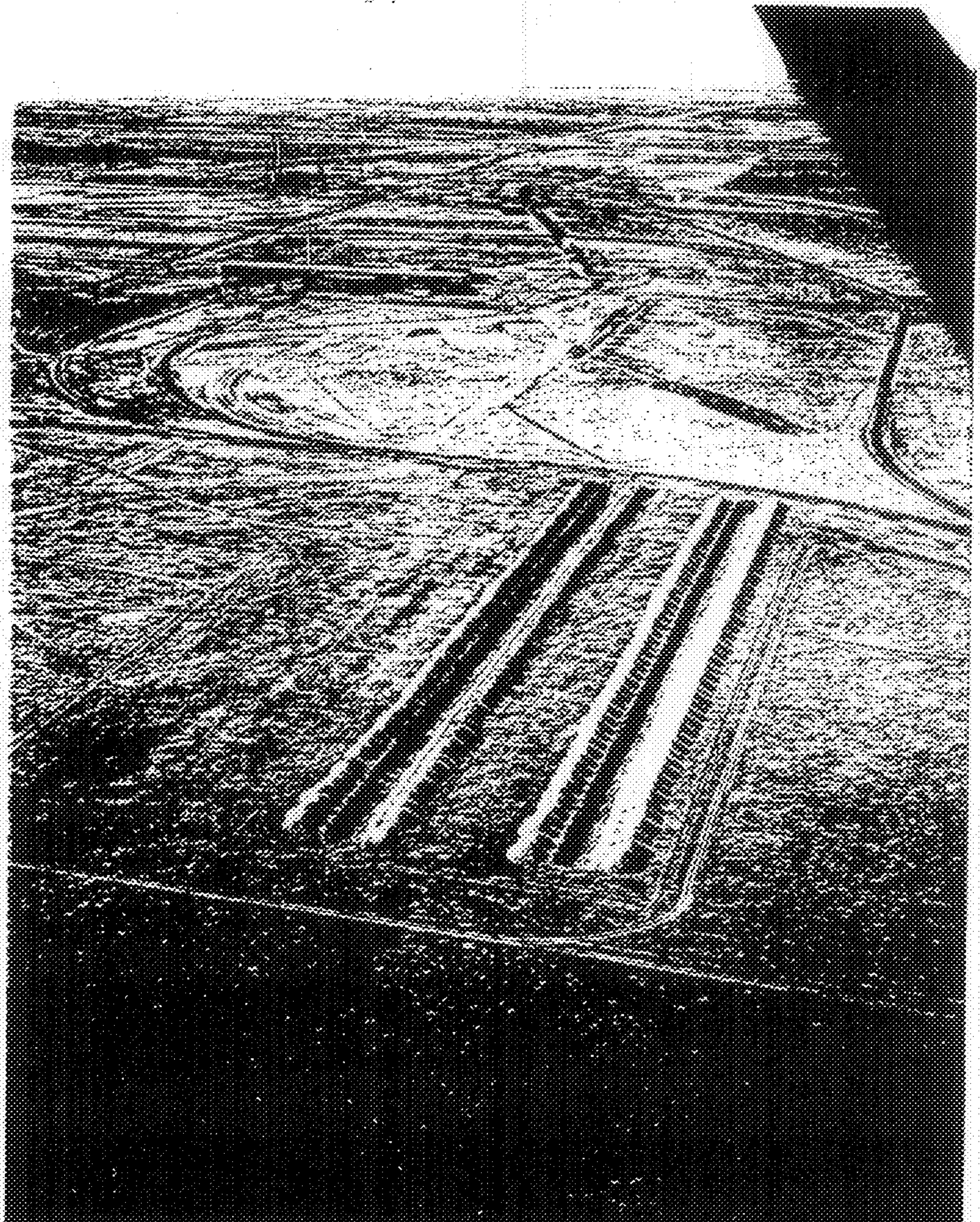
Photograph A-39. 216-B-62 Crib (current conditions).



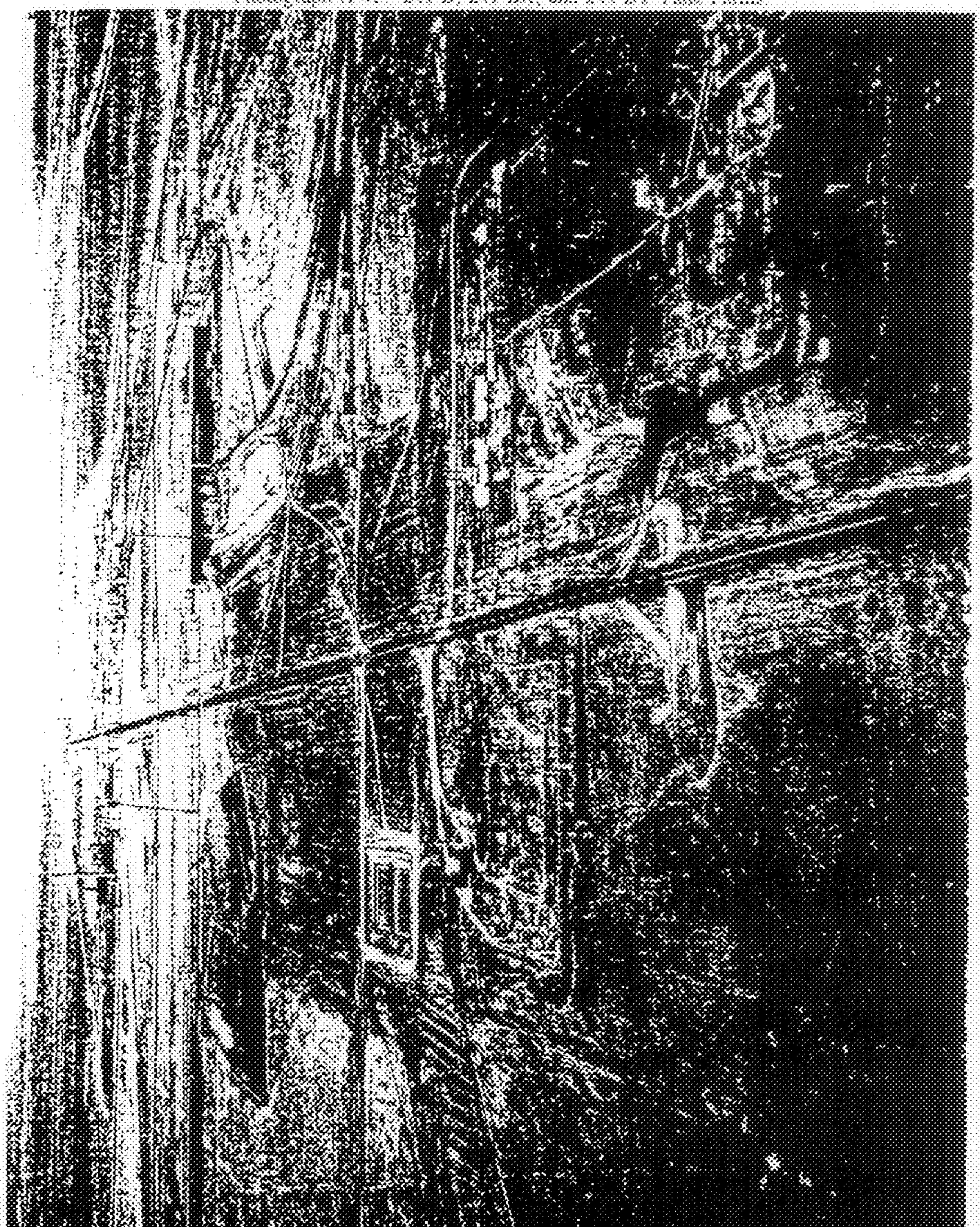
Photograph A-40. 216-B-64 Retention Basin.



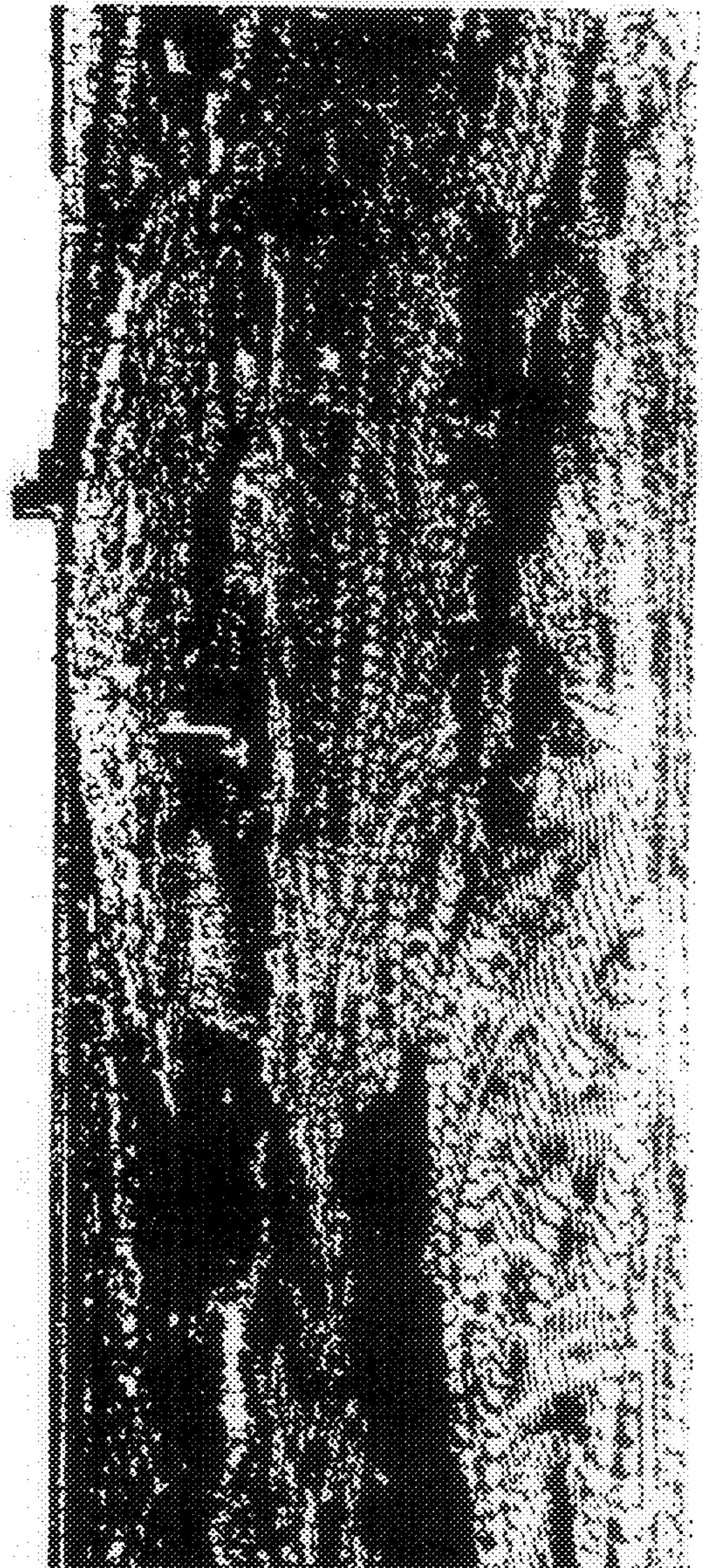
Photograph A-41. 218-E-10 Burial Ground



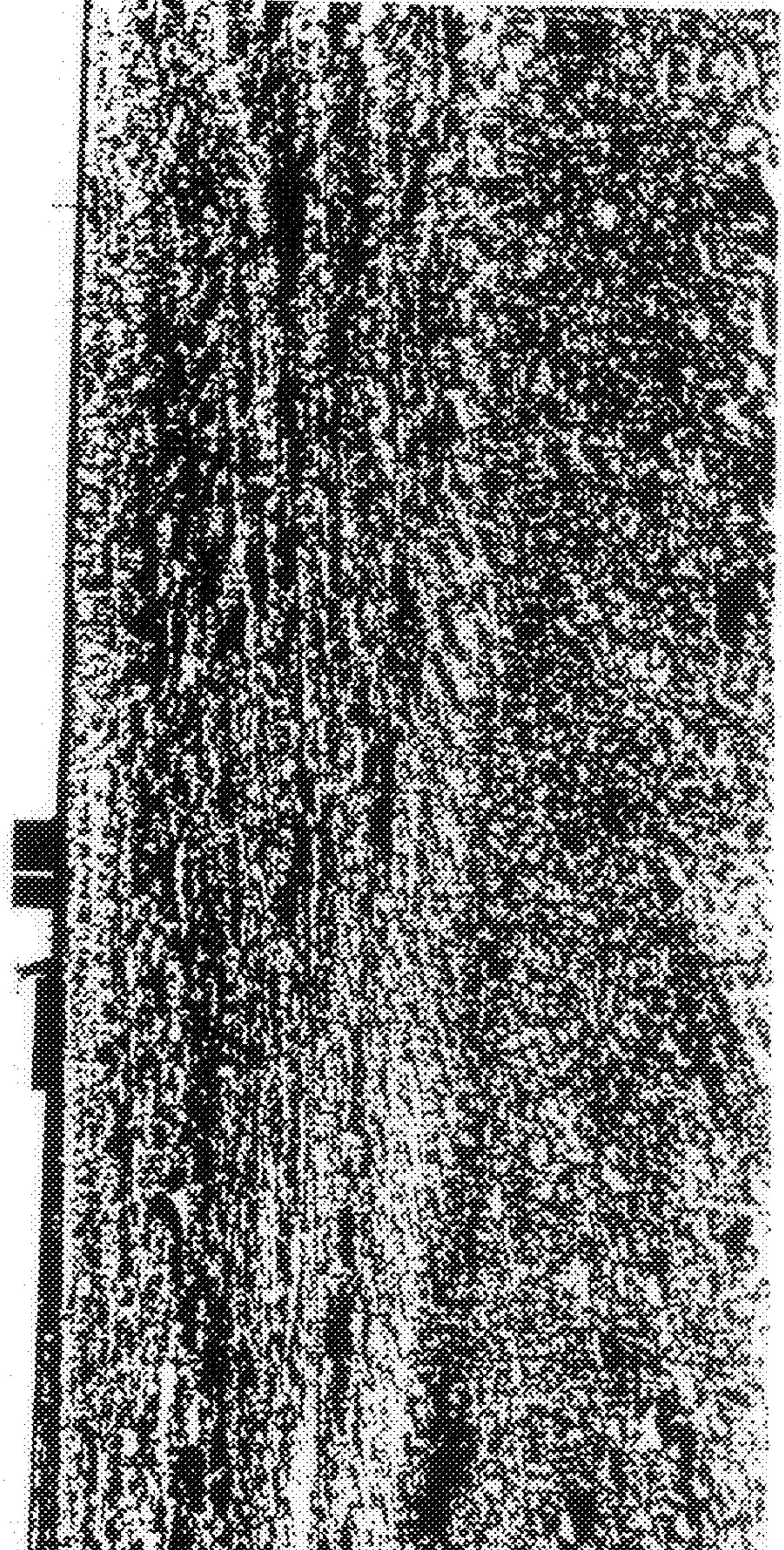
Photograph A-47. 241-B, 241-BX, and 241-BY Tank Farms



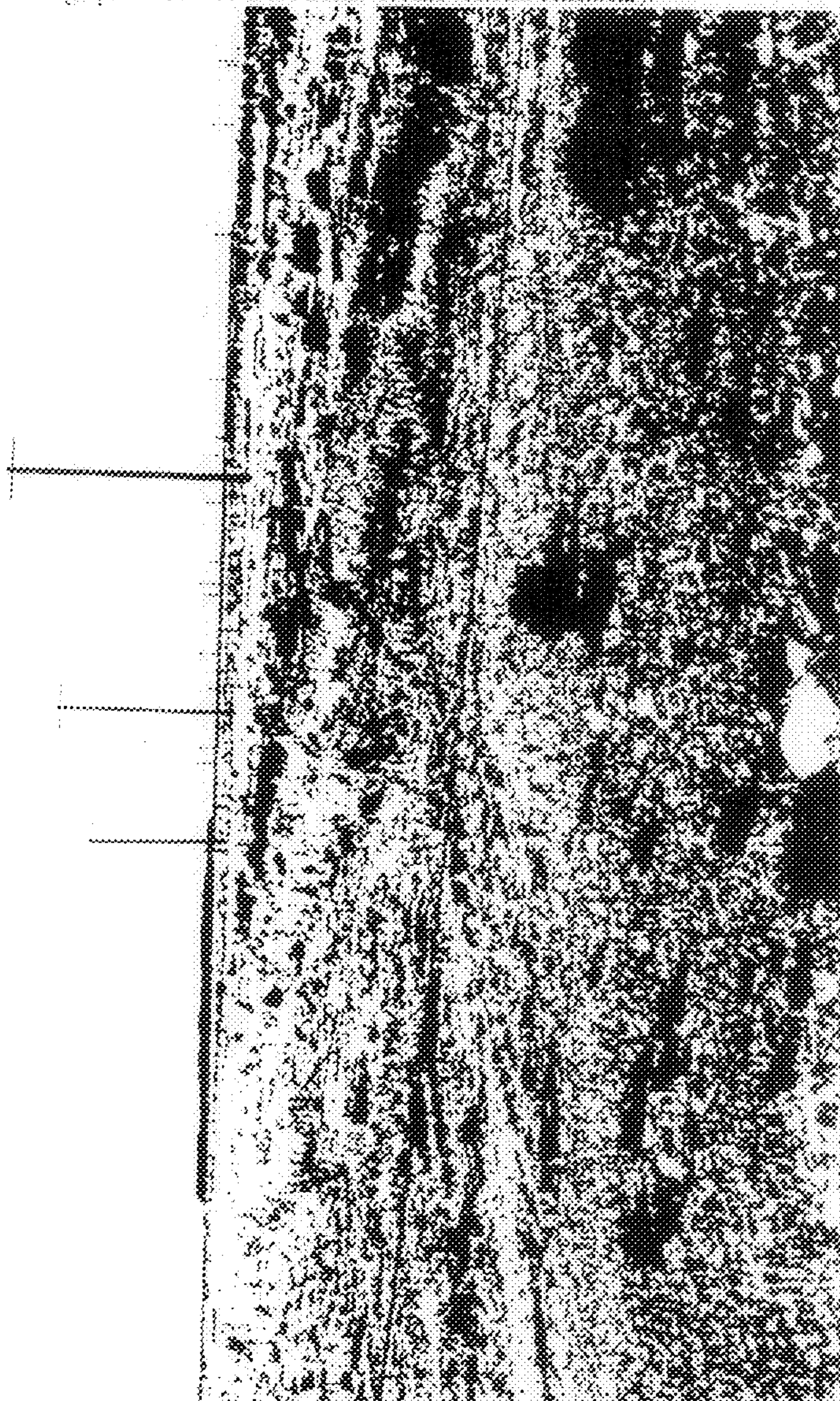
Photograph A-43. 218-E-2, 218-E-5, 218-E-5A, and 218-E-9 Burial Grounds.



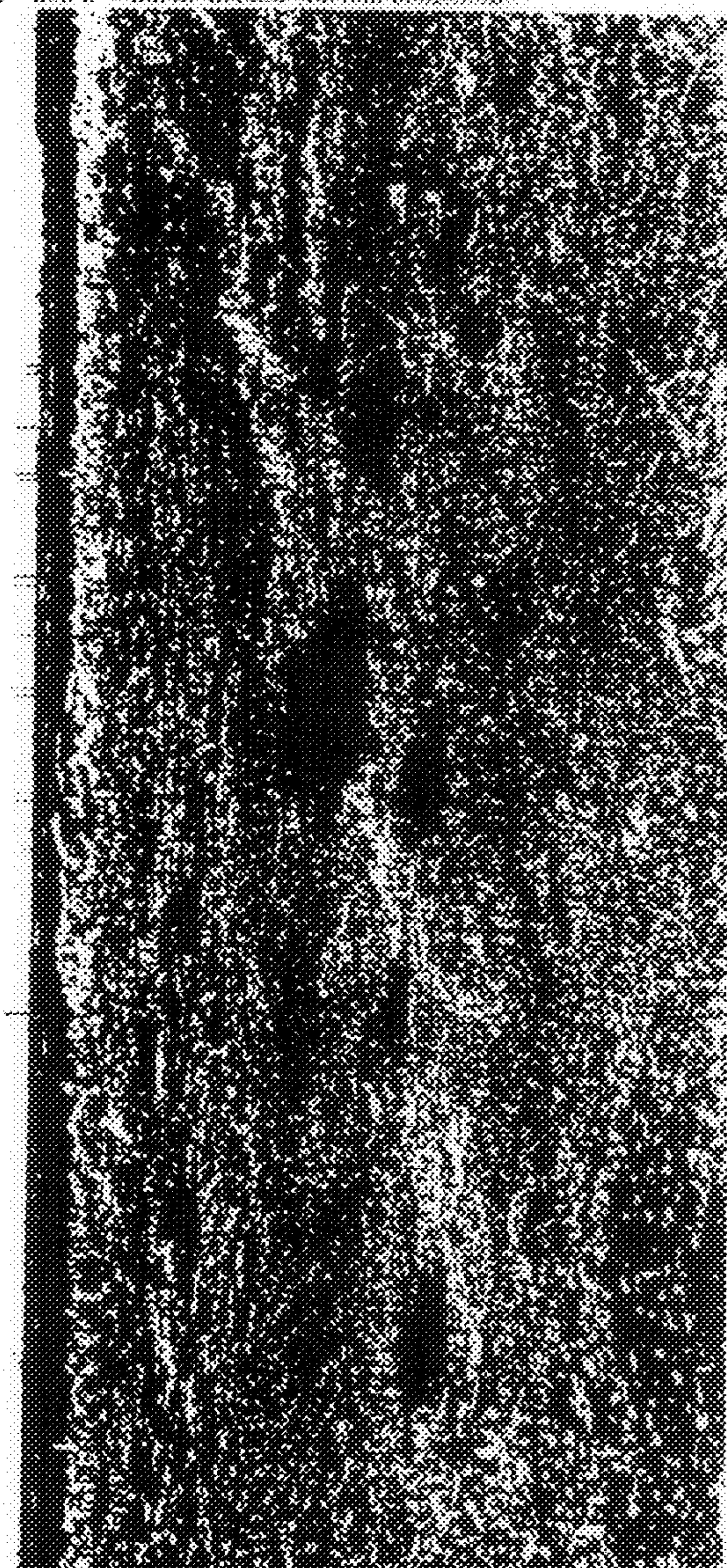
Photograph A-44. 218-E-5A Burial Ground (near current conditions).



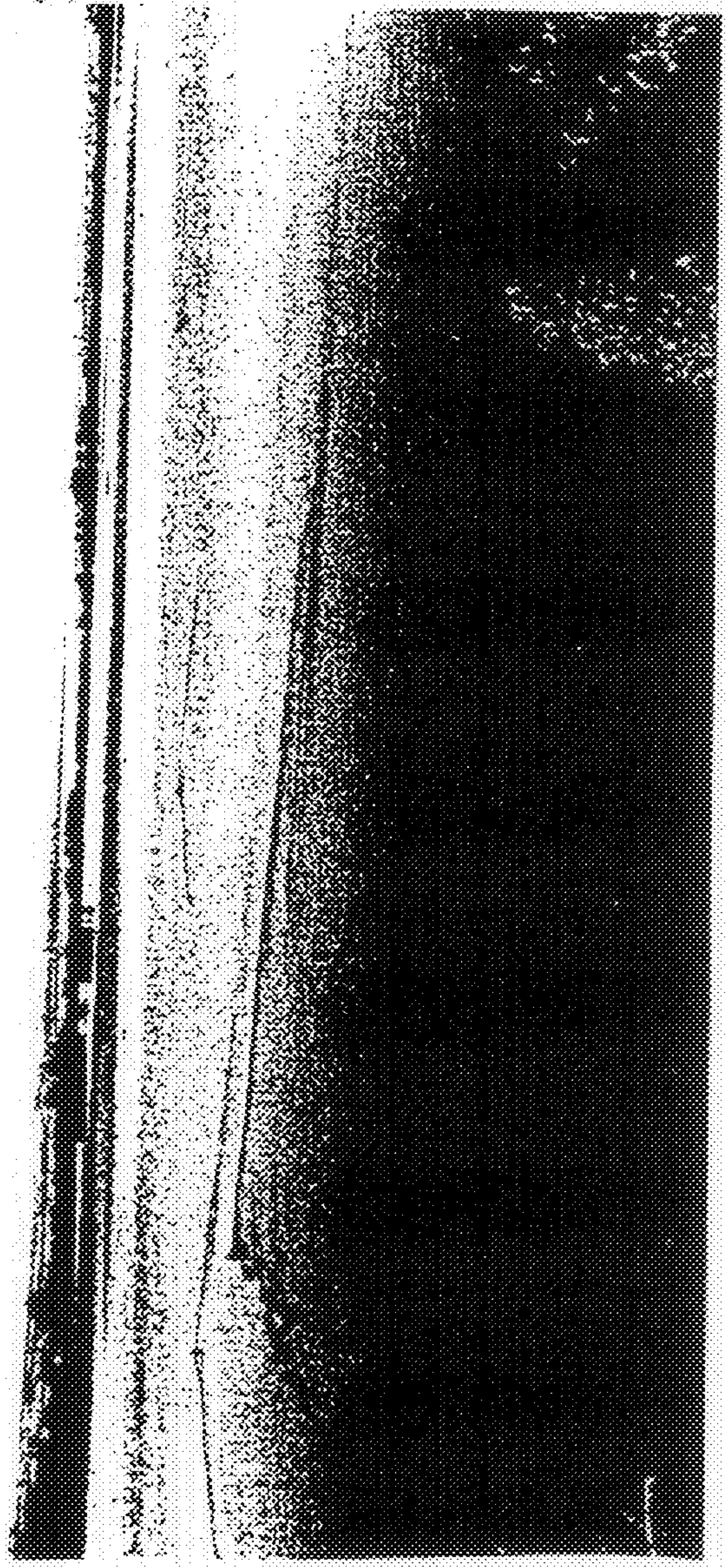
Photograph A-45. 218-E-2A Burial Ground (current conditions).



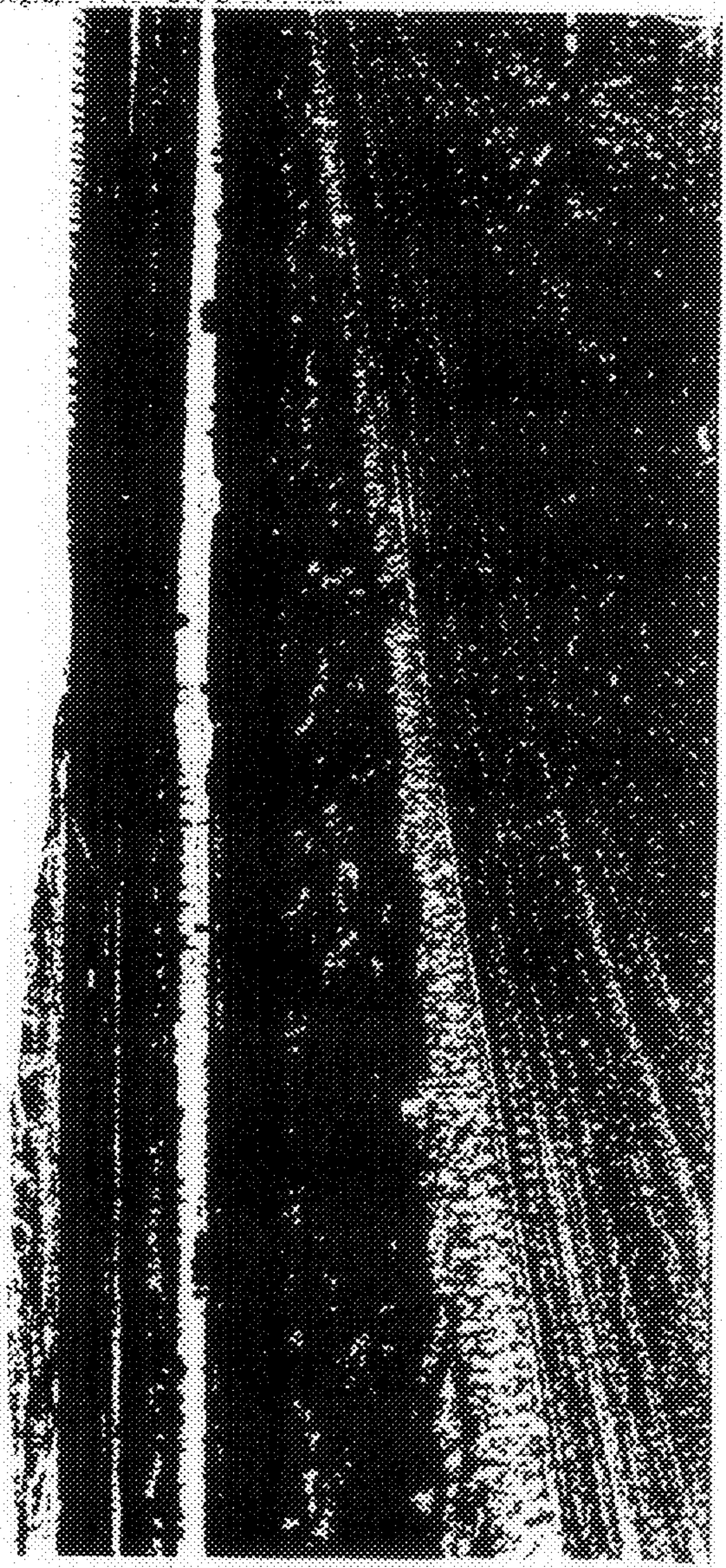
Photograph A-46 218-F-4 Burial Ground (current conditions)



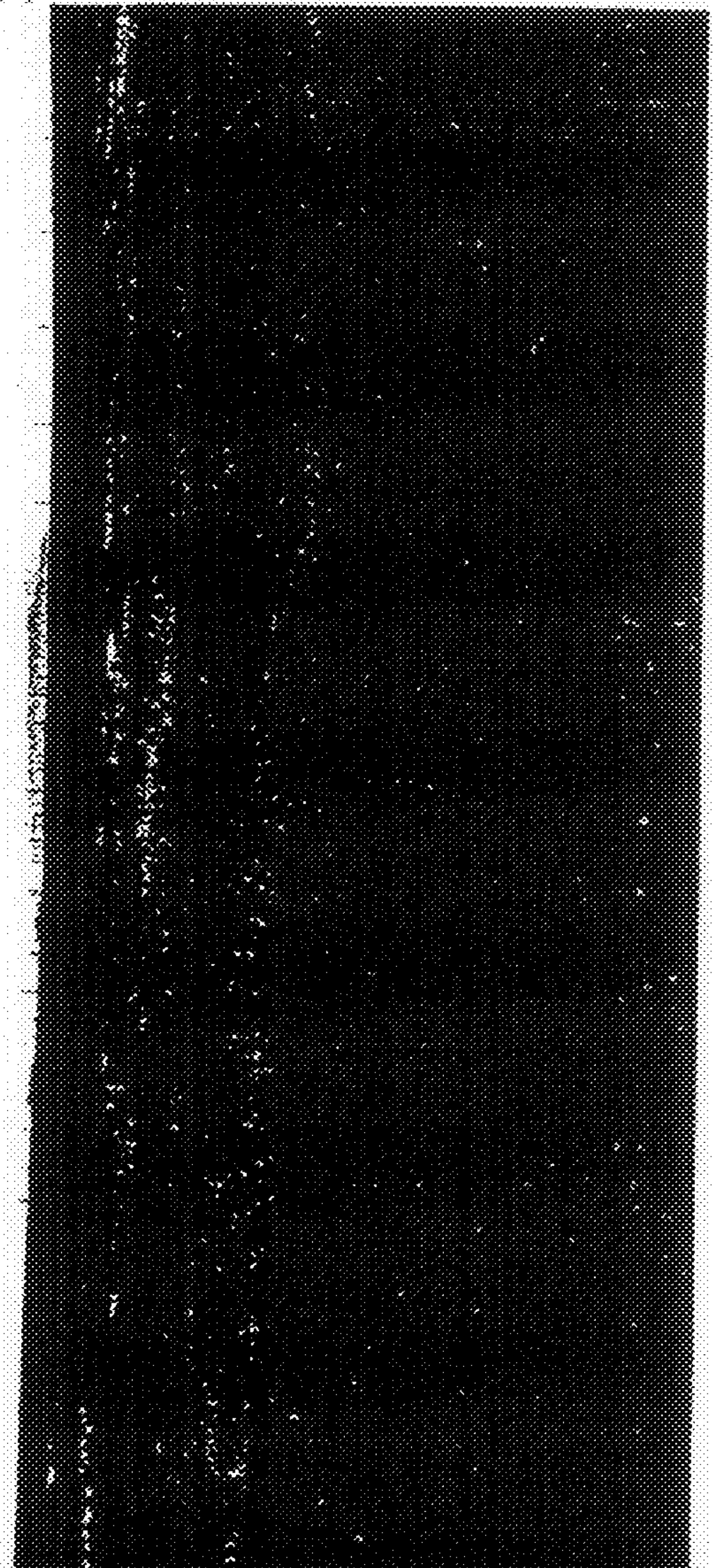
Photograph A-47. 216-B-3 Pond.



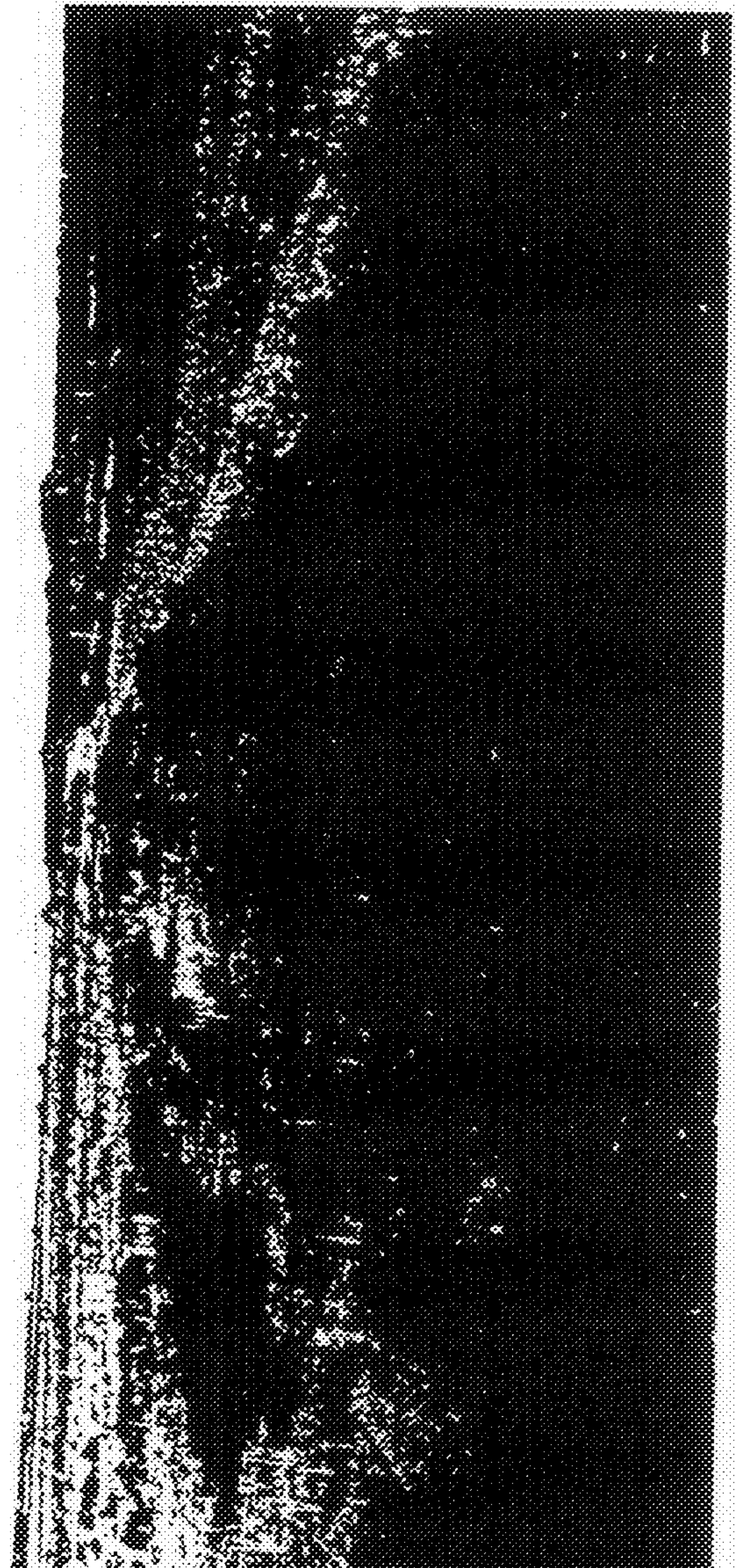
Photograph A-48. 216-B-3A Pond.



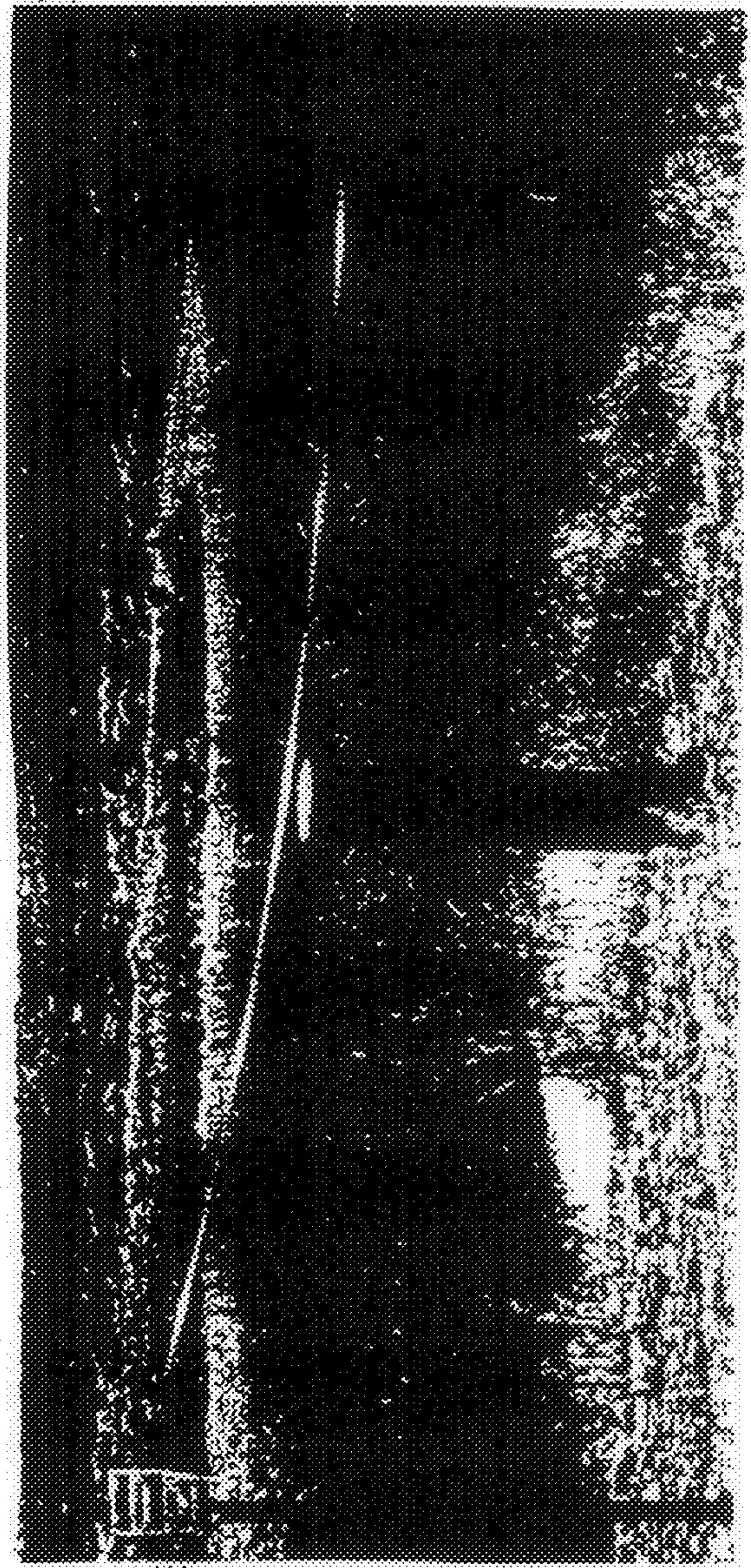
Photograph A-49. 216-B-3-1 Ditch



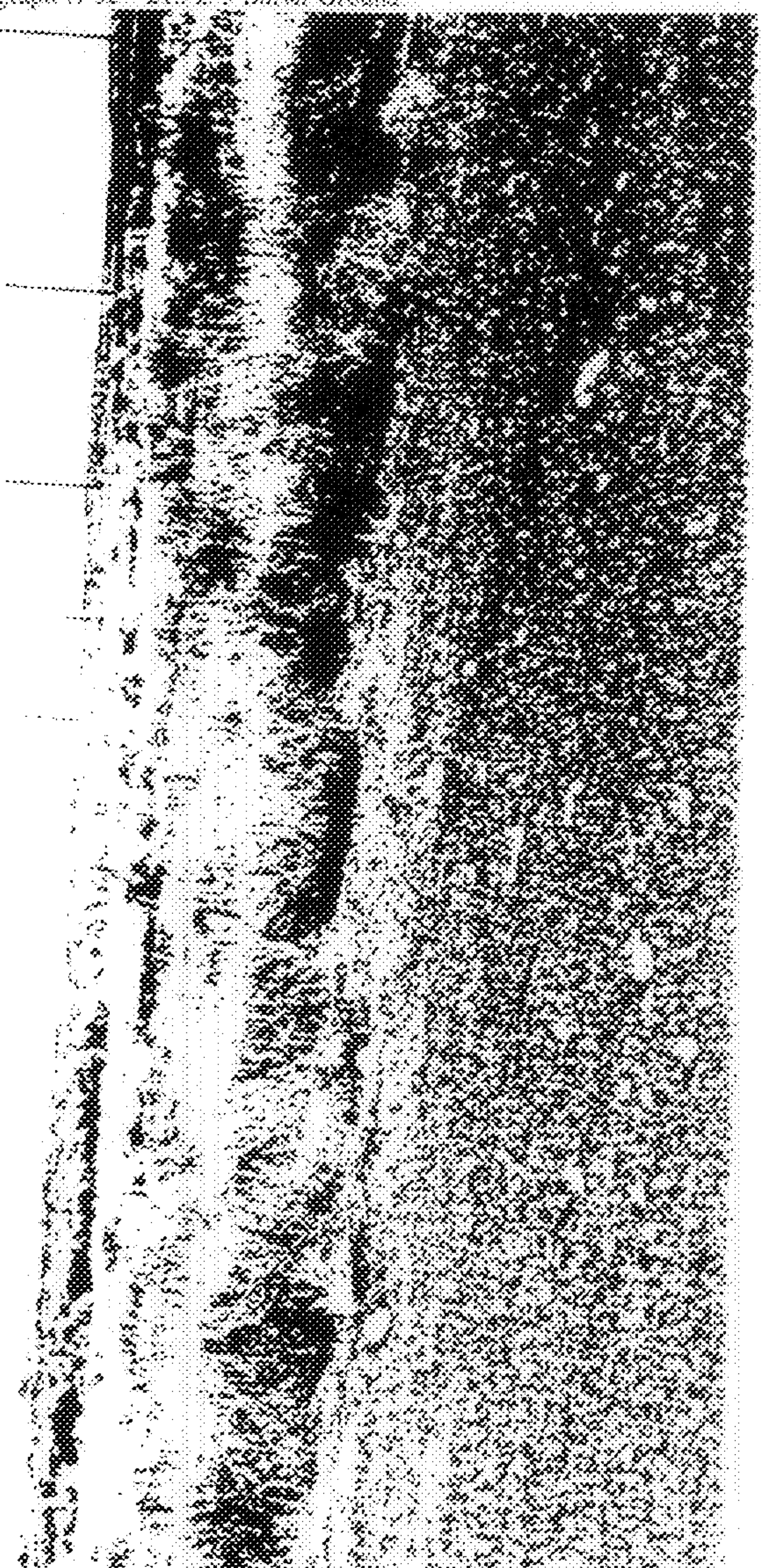
Photograph A-50. 216-B-3-2 Ditch.



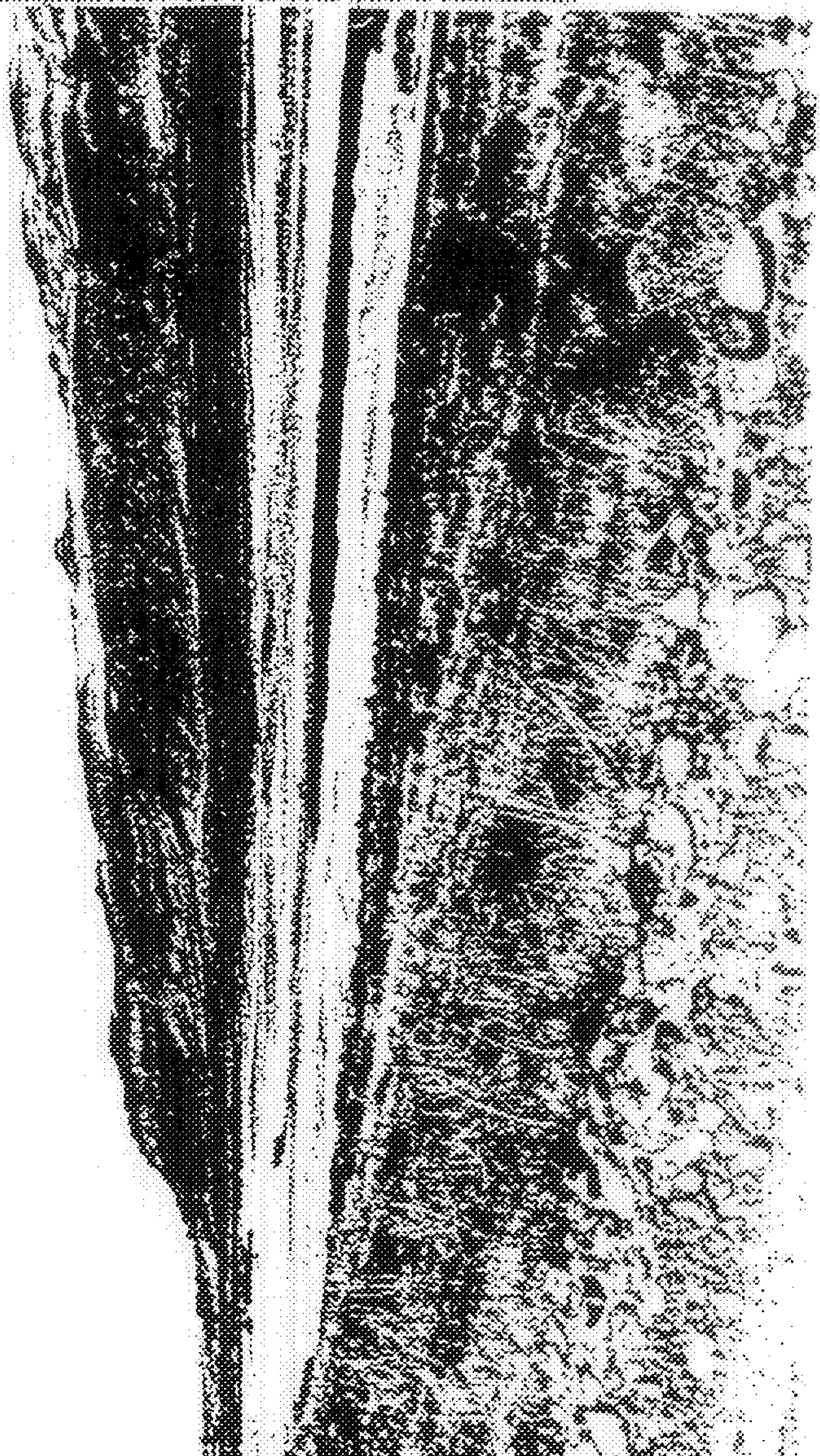
Photograph A-51. 216-B-3-3 Ditch.



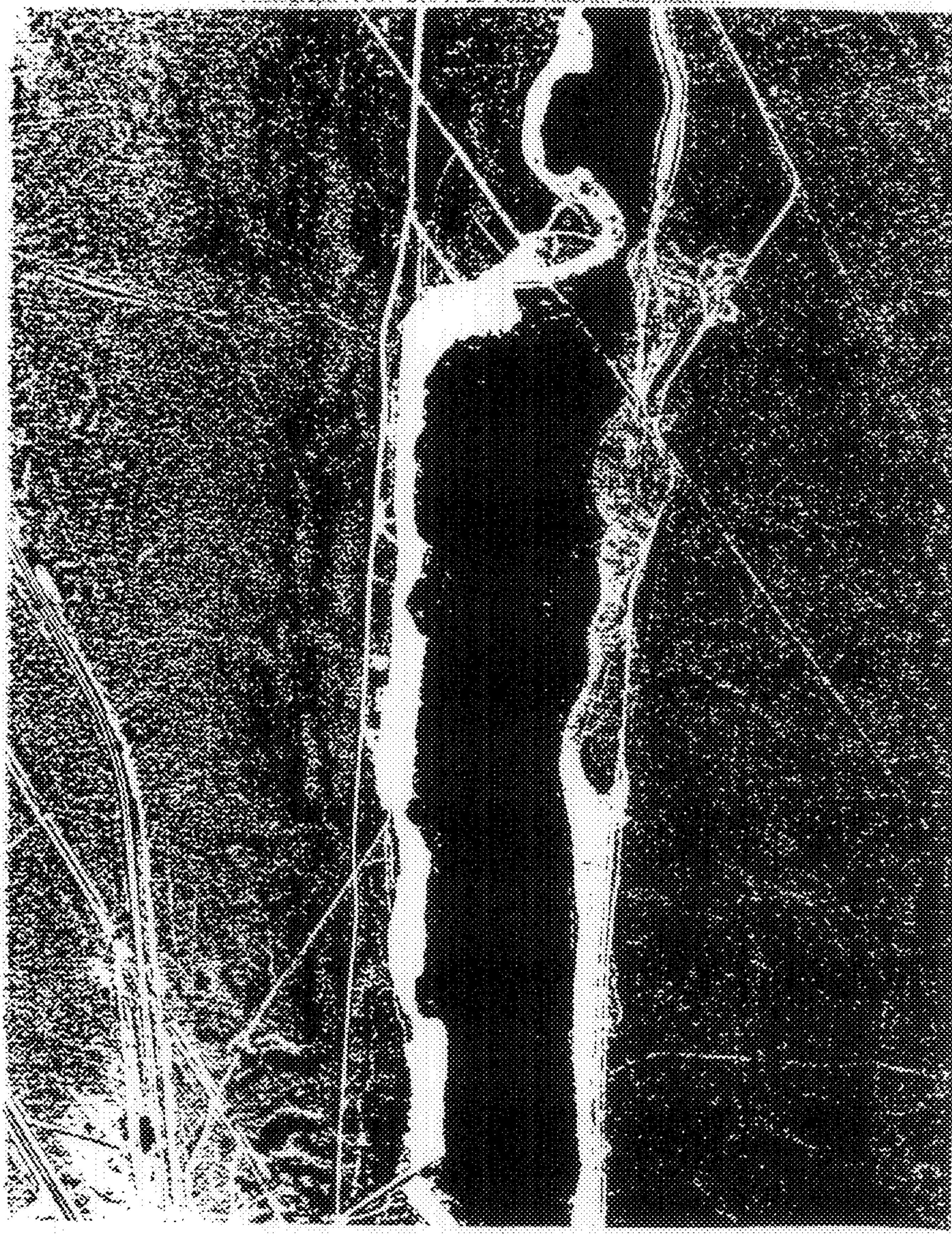
Photograph A-52. 218-E-3 Burial Ground



Photograph A-53. 216-A-25 Pond (prior to stabilization).

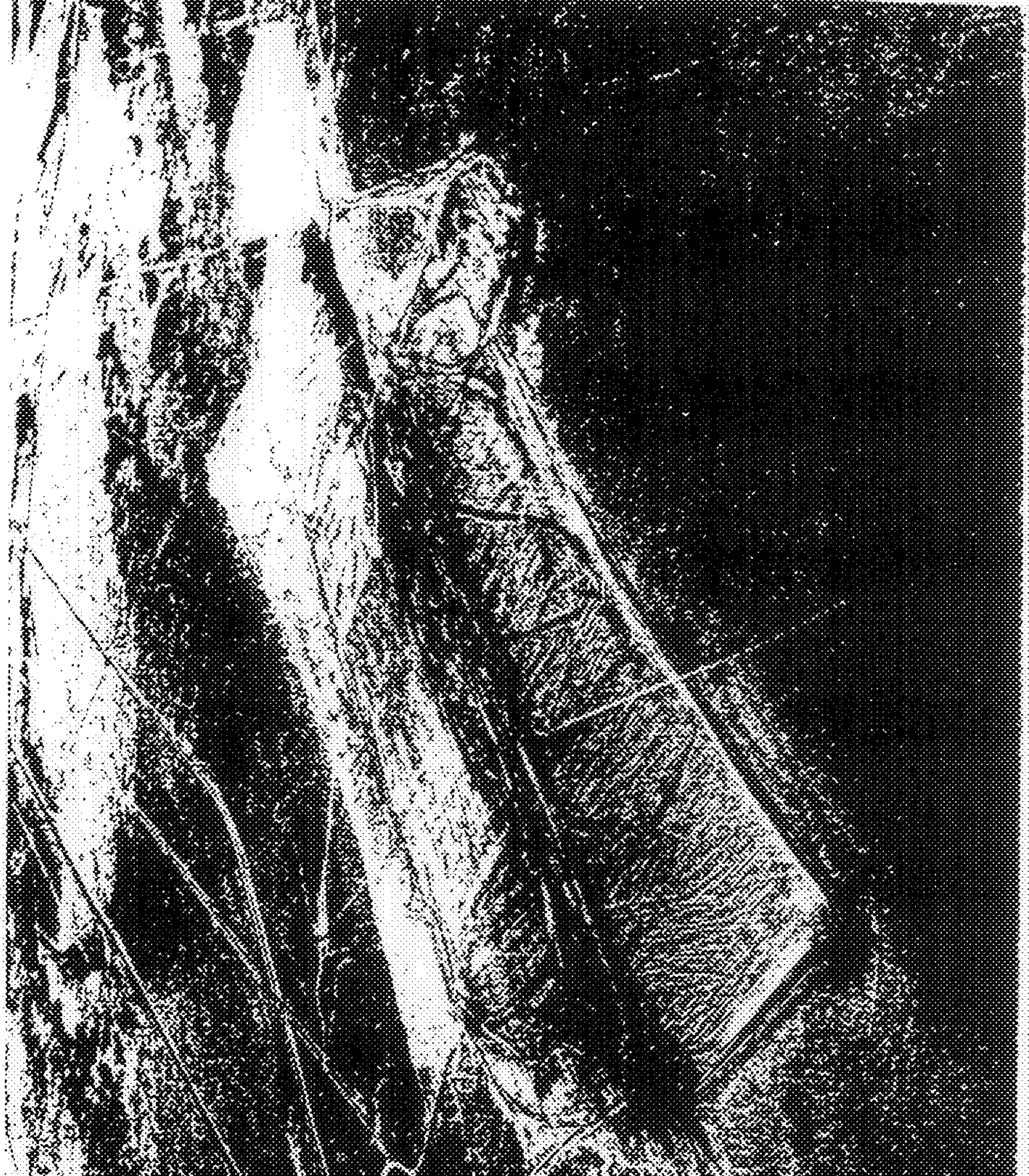


Photograph A-54. 216-A-25 Pond (interim stabilization).



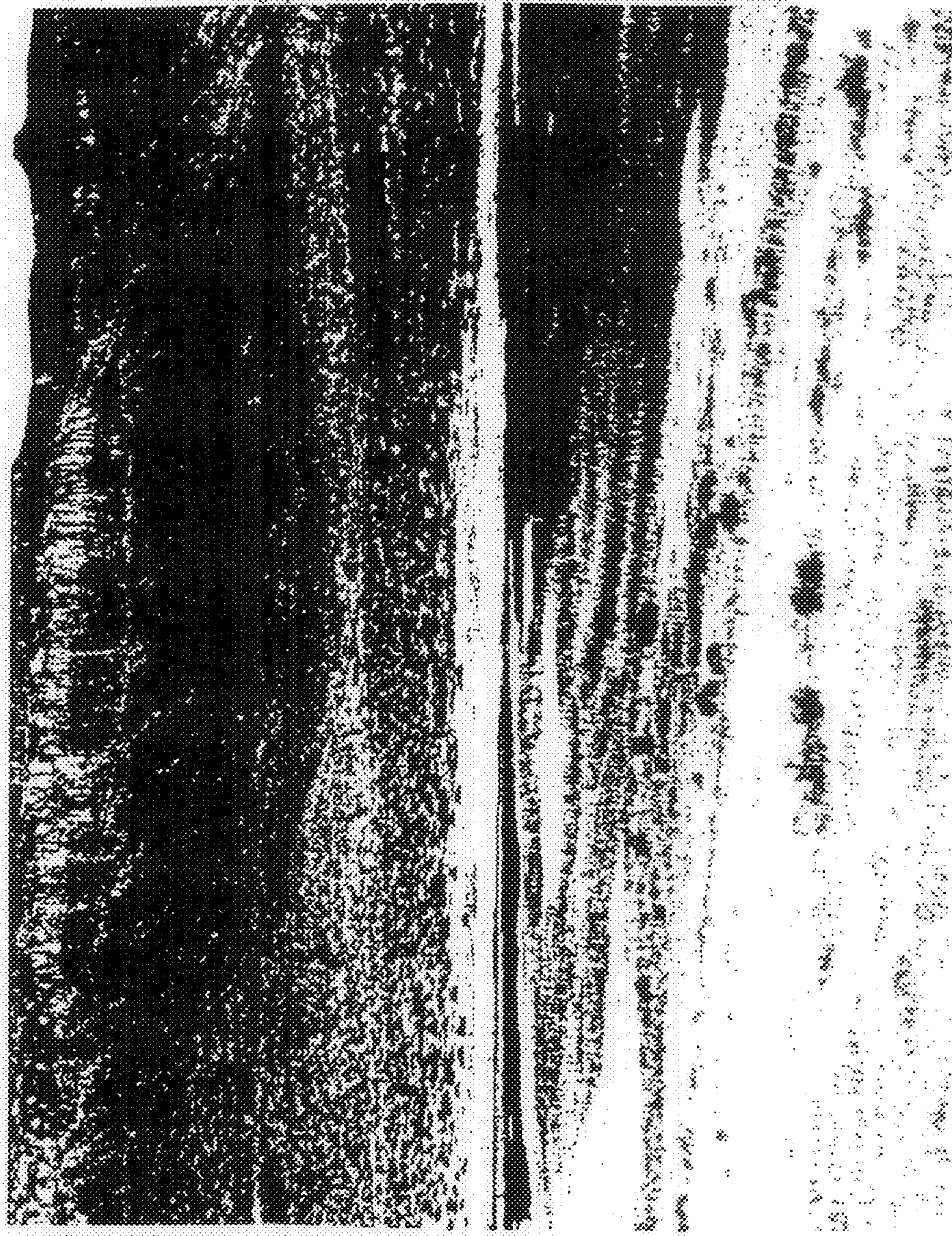
Photograph A-55. 216-A-25 Pond (phase II interim stabilization).

Photograph A-58. 216-A-25 Pond (phase III interim stabilization)



Photograph A-57. 216-N-8 Pond (3/4 mile west of Gable Mountain Pond).

Photograph A-58. 216-N-8 Pond (Gable Mountain in background)



APPENDIX B

PHOTOGRAPHS AND TECHNICAL DRAWINGS LIST

Table B-1. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-1.

Site	Photograph	Key Drawing	Other Selected Drawings		
216-B-43	122440-56-CN	H-2-2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216-B-44	122440-56-CN	H-2-2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216-B-45	122440-56-CN	H-2-2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216-B-46	122440-56-CN	H-2-2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216-B-47	122440-56-CN	H-2-2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216 B-48	122440-56-CN	H-2-2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216-B-49	122440-56-CN	H-2-2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216-B-50	122440-56-CN	H-2 2605	H-2-2603	H-2-44501 #141	H-2-44502 #9
216-B-57	122440-57-CN	H-2-62406			
216-B-61	122440-55-CN	H-2-34522	H-2-44502 #9		
UN-200-E-110	NONE INDICATED	H-2-34522	H-2-2603	SK-2-21878	H-2-34522
UN-200-E-63	NONE INDICATED	H-2-34522	H-2-2603	SK-2-21878	H-2-34522
UN-200-E-89	NONE INDICATED	H-2-34522	H 2-2603	SK-2-21878	H-2-34522
UN-200-E-9	NONE INDICATED	H-2-34522	H-2-2603	SK-2-21878	H-2-34522

Table B-2. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-2.

Site	Photograph	Key Drawing	Other Selected Drawings						
216-B-14	122440-32-CN	H-2-2907	H-2-2900	H-2-34761	H-2-2932	H-2-3232	H-2-35020	H-2-44502 #21	H-2-57210
216-B-14	692608-22-CN								
216-B-15	122440-32-CN	H-2-2907	H-2-2900	H-2-2932	H-2-44502 #21	H-2-35020			
216-B-15	692608-22-CN								
216-B-16	122440-32-CN	H-2-2907	H-2-2932	H-2-3232	H-2-35020	H-2-2900	H-2-44502 #21		
216-B-16	692608-22-CN								
216-B-17	122440-32-CN	H-2-2907	H-2-2900	H-2-2932	H-2-44502 #21				
216-B-17	692608-22-CN								
216-B-18	122440-32-CN	H-2-2907	H-2-2900	H-2-3232	H-2-2932	H-2-35020	H-2-44502 #21		
216-B-18	692608-22-CN								
216-B-19	122440-32-CN	H-2-2907	H-2-2900	H-2-35020	H-2-44502 #21				
216-B-19	692608-22-CN								
216-B-20	122440-34-CN	H-2-3203	H-2-3204	H-2-35020					
216-B-20	692608-22-CN								
216-B-21	122440-34-CN	H-2-3203	H-2-3204	H-2-35020					
216-B-21	692608-22-CN								
216-B-22	122440-34-CN	H-2-3203	H-2-3204	H-2-35020					
216-B-22	692608-22-CN								
216-B-23	122440-35-CN	H-2-3232	H-2-3233	H-2-35020					
216-B-23	692608-22-CN								
216-B-24	122440-35-CN	H-2-3232	H-2-3233	H-2-35020					
216-B-24	692608-22-CN								
216-B-25	122440-35-CN	H-2-3232	H-2-3233	H-2-35020					
216-B-25	692608-22-CN								
216-B-26	122440-35-CN	H-2-3232	H-2-3233	H-2-35020					
216-B-26	692608-22-CN								
216-B-27	122440-35-CN	H-2-3232	H-2-3233	H-2-35020					
216-B-27	692608-22-CN								
216-B-28	122440-35-CN	H-2-3232	H-2-3233	H-2-35020					
216-B-28	692608-22-CN								
216-B-29	122440-36-CN	H-2-3336	H-2-3337	H-2-35020	H-2-33365				
216-B-29	692608-22-CN								
216-B-30	122440-36-CN	H-2-3336	H-2-3337	H-2-35020					
216-B-30	692608-22-CN								
216-B-31	122440-36-CN	H-2-3336	H-2-3337	H-2-35020					
216-B-31	692608-22-CN								
216-B-32	122440-36-CN	H-2-3336	H-2-3337	H-2-35020					
216-B-32	692608-22-CN								
216-B-33	122440-36-CN	H-2-3336	H-2-3337	H-2-35020					
216-B-33	[illegible]608-22-CN								

Table B-2. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-2.

216-B-34	122440-36-CN	H-2-3336	H-2-3337	H-2-35020
216-B-34	692608-22-CN			
216-B-52	122440-35-CN	H-2-3336	H-2-3337	H-2-35020
216-B-52	692608-22-CN			
216-B-53A	692608-22-CN	H-2-3336	H-2-3337	H-2-35020
216-B-53B	692608-22-CN	H-2-3336	H-2-3337	H-2-35020
216-B-54	692608-22-CN	H-2-3336	H-2-3337	H-2-35020
216-B-58	692608-22-CN	H-2-3336	H-2-33400	
UN-200-E-83	122440-33-CN	H-2-35020	H-2-44500 #7	H-2-44502 #21

Table B-3. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-3.

Site	Photograph	Key Drawing	Other Selected Drawings			
216-B-35	122440-58-CN	H-2-37986	H-2-2471	H-2-36443	H-2-44501 #141	H-2600-E #33
216-B-35	40599-42-CN					
216-B-36	122440-58-CN	H-2-37986	H-2-2431	H-2-36443	H-2-44501 #141	SK-2-2408
216-B-36	40599-42-CN					
216-B-37	122440-58-CN	H-2-37986	SK-2-2408	H-2-2431		
216-B-37	40599-42-CN					
216-B-38	122440-58-CN	H-2-37986	H-2-36443	H-2-2431	H-2-44501 #141	SK-2-2408
216-B-38	40599-42-CN					
216-B-39	122440-58-CN	H-2-37986	H-2-36443	H-2-2471	H-2-44501 #141	SK-2-2408
216-B-39	40599-42-CN					
216-B-40	122440-58-CN	H-2-37986	H-2-36443	H-2-2431	H-2-44501 #141	SK-2-2408
216-B-40	40599-42-CN					
216-B-41	122440-58-CN	H-2-37986	H-2-36443	H-2-2431	H-2-44501 #141	SK-2-2408
216-B-41	40599-42-CN					
216-B-42	122440-58-CN	H-2-37986	H-2-36443	H-2-2431	H-2-44501 #141	SK-2-2408
216-B-42	40599-42-CN					

Table B-4. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-4.

Site	Photograph	Key Drawing	Other Selected Drawings					
216-B-11A & B	122440-78-CN	H-2-2024	H-2-2605	H-2-44502 #12	H-2-2021	H-2-2028	H-2-2928	H-2-3058
216-B-51	122440-76-CN	H-2-2908	H-2-2902	H-2-44502 #9				
216-B-7A & B	122440-81-CN	H-2-558	H-2-579	H-2-2021 #1	H-2-44501 #140	H-2-44502 #12		
216-B-8TF	122440-80-CN	H-2-579	H-2-738	H-2-2928	H-2-44501 #140	H-2-44502 #12		

Table B-5. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-5.

Site	Photograph	Key Drawing	Other Selected Drawings		
216-B-5	122440-101-CN	H-2-1031	H-2-1123	H-2-44502 #24	H-2-2021 #2
216-B-56	122440-85-CN	H-2-60329	H-2-60331	H-2-44502 #24	SK-2-19674
216-B-59	122440-84-CN	H-2-60310	H-2-71208	H-2-37859	SK-2-43917
216-B-59B	122440-84-CN	H-2-60310	H-2-71208	H-2-37859	SK-2-43917
216-B-9TF	122440-100-CN	H-2-1031	H-2-1123	H-2-44502 #24	H-2-2021 #2
241-B-154	NONE INDICATED	H-2-2021 #2	H-2-44502 #24	H-2-432	H-2-2338 #16
241-B-302B	NONE INDICATED	H-2-432	H-2-44501 #96	H-2-44502 #24	
241-B-361	NONE INDICATED	H-2-44502 #24	H-2-44501 #96		
UN-200-E-45	NONE INDICATED	H-2-44501 #96			
UN-200-E-7	NONE INDICATED	H-2-44500 #6			
UPR-200-E-77	NONE INDICATED	H-2-2021 #2	H-2-44501 #96	H-2-2600-E #28	H-2-24761

Table B-6. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-6.

Site	Photograph	Key Drawing	Other Selected Drawings			
216-B-10A	122440-67-CN	H-2-1649	H-2-1722			
216-B-10B	122440-68-CN	H-2-1649	H-2-1722	H-2-32522		
216-B-13	122440-74-CN	H-2-2926	M-2600-E #28			
216-B-4	122440-73-CN	H-2-1722	H-2-1100	H-2 34761	M-2600 #28	
216-B-6	122440-72-CN	H-2-44501 #86	H-2-2431	H-2-34761	HW-69870 #3	
216-B-60	122440-206-CN	H-2-34303				
218-E-6	122440-208-CN	H-2-44501 #86	H-2-2706	HW-60807	M-2600-E #28	H-2-34761
218-E-7	122440-70-CN	H-2-757	H-2-1938	H-2-94662		
224-B	NONE INDICATED	NONE INDICATED				
224-B CF	NONE INDICATED	H-2-44501 #86				
226-B	NONE INDICATED	NONE INDICATED				
226-B HWSA	NONE INDICATED	H-2-44501 #86				
241-BX-154	74538-7CN	H-2-857	H-2-44502 #24	H-2-2338 #19		
241-BX-155	74538-7CN	H-2-638	H-2-44502 #12	H-2 44501 #118		
241-BX-302B	74538-7CN	H-2 636	H-2-44502 #24	H-2-857		
241-BX-302C	74538-7CN	H-2-638	H-2-44502 #12	H-2-638		
241-ER-152	NONE INDICATED	H-2-44501 #86	H 2-2338 #60			
241-ER-311	NONE INDICATED	H-2-71670				
2607-E3	NONE INDICATED	H-2-1223	W-71192	H-2-44501 #108		
2607-E4	NONE INDICATED	W-71192	H-2-44501 #86			
270-E C.N.T.	NONE INDICATED	H-2-43118	H-2-44501 #97			
291-B	NONE INDICATED	NONE INDICATED				
B PLANT FILTER	NONE INDICATED	H-2-44501 #85				
KAISER HOT STOR	NONE INDICATED	NONE INDICATED				
T.F.S. 218-E-4	NONE INDICATED	H-2-1223	H-2-44501 #108			
UN-200-E-1	NONE INDICATED	H-2-44501 #86				
UN-200-E-103	NONE INDICATED	H-2-44500 #6				
UN-200-E-140	NONE INDICATED	H-2-44500 #6				
UN-200-E-2	NONE INDICATED	H-2-44501 #85				
UN-200-E-3	NONE INDICATED	H-2-44501 #96				
UN-200-E-41	NONE INDICATED	H-2-44500 #6				
UN-200-E-44	NONE INDICATED	H-2-44500 #6				
UN-200-E-45	NONE INDICATED	H-2-44501 #96				
UN-200-E-52	NONE INDICATED	H-2-44500 #6				
UN-200-E-54	NONE INDICATED	H-2-44501 #97				
UN-200-E-55	NONE INDICATED	H-2-44500 #6				
UN-200-E-69	NONE INDICATED	H-2-44501 #96				
UN-200-E-80	NONE INDICATED	H-2-44500 #7	H-6-951	H-2-34761	M-2-2600-E #28	
UN-200-E-85	NONE INDICATED	H-2-44500 #7	H-2-34761	M-2600-E #28		
UN-200-E-87	NONE INDICATED	H-2-44500 #86	H-2-34761	M-2600-E #28		

Table B-6. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-6.

UN-200-E-90	NONE INDICATED	H-2-44501 #86	H-2600-E #28	
UPR-200-E-78	NONE INDICATED	H-2-44501 #118	H-2-34761	H-2-2600E #28

Table B-7. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-7.

Site	Photograph	Key Drawing	Other Selected Drawings							
241-B-101	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-1743	SK-2-18625		
241-B-102	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-1743	SK-2-18625		
241-B-103	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-1743	SK-2-18625		
241-B-104	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-1743	SK-2-18625		
241-B-105	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-1743	SK-2-18625		
241-B-106	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-1743	SK-2-18625		
241-B-107	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-44502 #9	H-2-1743	SK-2-18625	
241-B-108	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-44502 #9	H-2-1743	SK-2-18625	
241-B-109	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-44502 #9	H-2-1743	SK-2-18625	
241-B-110	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-44502 #9	H-2-1743	SK-2-18625	
241-B-111	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-44502 #9	H-2-1743	SK-2-18625	
241-B-112	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-579	H-2-610	HW-72743	H-2-44502 #9	H-2-1743	SK-2-18625	
241-B-151	NONE INDICATED	HW-72183 #3	H-2-44502 #12	H-2-2338 #13						
241-B-152	NONE INDICATED	HW-72182 #3	H-2-44502 #12	H-2-2338 #14						
241-B-153	NONE INDICATED	H-2-36834	H-2-44502 #12	H-2-2338 #15						
241-B-201	NONE INDICATED	HW-72182	H-2-44502 #12	H-2-610	M-2600-E #33	H-2-1743				
241-B-202	NONE INDICATED	HW-72182	H-2-44502 #12	H-2-610	M-2600-E #33	H-2-1743				
241-B-203	NONE INDICATED	HW-72182	H-2-44502 #12	H-2-610	M-2600-E #33	H-2-1743				
241-B-204	NONE INDICATED	HW-72182	H-2-44502 #12	H-2-610	M-2600-E #33	H-2-1743				
241-B-252	NONE INDICATED	H-2-36834	H-2-2338 #17							
241-B-301B	NONE INDICATED	H-2-44502 #12	H-2-44500 #6							
241-BR-152	NONE INDICATED	H-2-44502 #12	H-2-2338 #14							
241-BX-101	NONE INDICATED	HW-72182 #3	H-2-44502 #11	H-2-607	H-2-44501 #140					
241-BX-102	NONE INDICATED	HW-72182 #3	H-2-44502 #11	H-2-607	H-2-44501 #140					
241-BX-103	NONE INDICATED	HW-72182 #3	H-2-44502 #11	H-2-607	H-2-44501 #140					
241-BX-104	NONE INDICATED	HW-72182 #3	H-2-44502 #10	H-2-607	H-2-44501 #140					
241-BX-105	NONE INDICATED	HW-72182 #3	H-2-44502 #10	H-2-607	H-2-44501 #140					
241-BX-106	NONE INDICATED	HW-72182 #3	H-2-607	H-2-44501 #140						
241-BX-107	NONE INDICATED	HW-72182 #3	H-2-607	H-2-44501 #140						
241-BX-108	NONE INDICATED	HW-72182 #3	H-2-607	H-2-44501 #140						
241-BX-109	NONE INDICATED	HW-72182 #3	H-2-607	H-2-44501 #140						
241-BX-110	NONE INDICATED	HW-72182 #3	H-2-607	H-2-44501 #140						
241-BX-111	NONE INDICATED	HW-72182 #3	H-2-607	H-2-44501 #140						
241-BX-112	NONE INDICATED	HW-72182 #3	H-2-607	H-2-44501 #140						
241-BX-153	NONE INDICATED	HW-72182 #3	H-2-44502 #11	H-2-612	H-2-44501 #140					
241-BX-302A	NONE INDICATED	HW-72182 #3	H-2-44502 #11	H-2-44501 #140						
241-BXR-151	NONE INDICATED	H-2-44500 #6								
241-BXR-152	NONE INDICATED	H-2-44502 #11	H-2-44500 #6							
241-BXR-153	NONE INDICATED	H-2-44502 #10	H-2-44500 #6							
241-BY-101	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #11	H-2-37853

Table B-7. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-7.

241-BY-102	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #11	H-2-37853
241-BY-103	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #11	H-2-37853
241-BY-104	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #10	H-2-37853
241-BY-105	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #10	H-2-37853
241-BY-106	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #10	H-2-37853
241-BY-107	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #9	H-2-37853
241-BY-108	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #9	H-2-37853
241-BY-109	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #9	H-2-37853
241-BY-110	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #9	H-2-37853
241-BY-111	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #9	H-2-37853
241-BY-112	NONE INDICATED	HW-72182 #3	H-2-35227	H-2-35235	H-2-62401	H-2-1307	H-2-1308	H-2-1309	H-2-44502 #9	H-2-37853
241-BYR-152	NONE INDICATED	H-2-44502 #11	H-2-44500 #6							
241-BYR-153	NONE INDICATED	H-2-44502 #10	H-2-44500 #6							
241-BYR-154	NONE INDICATED	H-2-44502 #9	H-2-44500 #6							
242-B-151	NONE INDICATED	H-2-2029	H-2-44502 #12	H-2-44500 #6						
244-BXR Vault	NONE INDICATED	H-2-44500 #6								
2607-EB	NONE INDICATED	W-71192	H-2-44500 #6							
UN-200-E-101	NONE INDICATED	H-2-44500 #6								
UN-200-E-105	NONE INDICATED	H-2-44500 #6								
UN-200-E-109	NONE INDICATED	H-2-44500 #6								
UN-200-E-43	NONE INDICATED	H-2-44500 #6								
UN-200-E-76	NONE INDICATED	H-2-44500 #7	H-2-34761	M-2-2600-E #33						
UN-200-E-79	NONE INDICATED	H-2-44500 #7	H-2-34761	M-2-2600-E #33						
UPR-200-E-108	NONE INDICATED	H-2-44500 #6								
UPR-200-E-116	NONE INDICATED	H-2-44500 #6								
UPR-200-E-127	NONE INDICATED	HW-72743								
UPR-200-E-128	NONE INDICATED	HW-72743	SK-2-18625	M-2600-E #33	H-2-610	HW-72182 #3	H-2-1743			
UPR-200-E-129	NONE INDICATED	HW-72182	H-2-610	H-2-1743	H-2-44501 #140	M-2600-E #33				
UPR-200-E-130	NONE INDICATED	H-2-1743								
UPR-200-E-131	NONE INDICATED	H-2-607	SK-2-18625	H-2-44501 #140						
UPR-200-E-132	NONE INDICATED	H-2-44501 #140								
UPR-200-E-133	NONE INDICATED	H-2-607	SK-2-18625	H-2-44501 #140						
UPR-200-E-134	NONE INDICATED	H-2-44501 #151	H-2-2101							
UPR-200-E-135	NONE INDICATED	H-2-2101	H-2-35227	H-2-35235	H-2-37853					
UPR-200-E-38	NONE INDICATED	H-2-44501 #129								
UPR-200-E-4	NONE INDICATED	H-2-44500 #7								
UPR-200-E-5	NONE INDICATED	H-2-44501 #140	HW-20438							
UPR-200-E-6	NONE INDICATED	H-2-44501 #129								
UPR-200-E-73	NONE INDICATED	H-2-44501 #129	H-2-34761		M-2-2600-E #33					
UPR-200-E-74	NONE INDICATED	H-2-44500 #7	M-2600-E #33	H-2-34761						
UPR-200-E-75	NONE INDICATED	H-2-44500 #7	M-2600-E #33	H-2-34761						

Table B-8. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-8.

Site	Photograph	Key Drawing	Other Selected Drawings			
207-B Retent B	9110166-1	SK-2-21273	W-73975	H-2-2021 #2	H-2-34761	
207-B Retent B	40599-33-CN					
207-B Retent B	692608-22-CN					
216-B-2-1	122440-98-CN	H-2-33119	H-2-56635	H-2-34761	H-2-44502 #9	
216-B-2-2	122440-97-CN	H-2-33119	H-2-34761	M-2600-E #24	M-2600-E #34	H-2-44502 #9
216-B-2-3	122440-94-CN	H-2-44502 #9	M-2600-E #27	H-2-34761		
216-B-63	122440-99-CN	H-2-33119	SK-2-21273	H-2-34761	H-2-33120	
2607-E9	NONE INDICATED	H-2-44500 #5	W-71192			
UPR-200-E-138	NONE INDICATED	H-2-33119	H-2-44500 #7			
UPR-200-E-32	NONE INDICATED	H-2-33119	H-2-44501 #128			

Table B-9. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-9.

Site	Photograph	Key Drawing	Other Selected Drawings					
200 Area Const	NONE INDICATED	H-2-44500 #6						
216-B-12	122440-65-CN	H-2-43029	H-2-43027	H-2-34524	H-2-43046	H-2-44502 #22	H-2-60330	SK-2-19674
216-B-55	122440-64-CN	H-2-60330	H-2-60331	H-2-44502 #24	SK-2-79674	H-2-60332		
216-B-62	122440-66-CN	H-2-34524	H-2-34525	H-2-44502 #22				
216-B-62	692608-21-CN							
216-B-64	122440-63-CN	H-2-71208	H-2-34761	H-2-37859	SK-2-43917			
241-ER-151	NONE INDICATED	H-2-71670	H-2-2537	H-2-43036	H-2-43046	H-2-44502 #22	H-2338 #47	
241-ER-311	NONE INDICATED	H-2-71670	H-2-44502 #22	H-2-2537	H-2-43036			
UN-200-E-64	NONE INDICATED	H-2-44500 #6						
UPR-200-E-84	NONE INDICATED	H-2-44501 #86						

Table B-10. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-10.

Site	Photograph	Key Drawing	Other Selected Drawings				
218-E-2	122440-59,60-CN	H-2-2479	H-2-55534	H-2-31269	H-2-34761	H-2-36442	
218-E-2A	122440-61-CN	H-2-55534	H-2-31269	H-2-36442	H-2-34761	H-2-2479	
218-E-4	122440-62-CN	H-2-55534	H-2-31269	H-2-34761	M-2600-E #28		
218-E-5	122440-59,60-CN	H-2-55534	H-2-34761	H-2-36442	H-2-31269	M-2600-E #28	H-2-2479
218-E-5A	122440-59,60-CN	H-2-55534	H-2-43761	H-2-31269	H-2-44501 #119	M-2600-E #28	H-2-2479
218-E-9	122440-59,60-CN	H-2-2479	H-2-34761	H-2-55534	M-2600-E #28	H-2-31269	
UN-200-E-112	NONE INDICATED	H-2-55534	H-2-44500 #6				
UN-200-E-61	NONE INDICATED	H-2-55534	H-2-44500 #6				
UN-200-E-95	NONE INDICATED	H-2-55534	M-2600-E #28	H-2-34761			

Table B-11. List of Photographs and Selected Technical Drawings for Operable Unit 200-BP-11.

Site	Photograph	Key Drawing	Other Selected Drawings						
216-B-3	122440-8-CN	H-6-829	H-2-2431	H-6-989	SK-2-4996	H-2-2936	H-6-418	H-6-485	H-6-706 #3
216-B-3-1	122440-213-CN	H-2-44500 #4							
216-B-3-2	122440-210-CN	H-2-44500 #4	H-2-34761	H-2-56635	M-2600-E #26				
216-B-3-3	122440-9-CN	H-2-44500 #4	H-6-707 #2,3	H-2-2429					
216-B-3A	122440-7-CN	H-6-829	H-6-706 #3	H-6-418	H-6-485				
216-B-3B	NONE INDICATED	H-6-829	H-6-706 #3	H-6-418	H-6-485				
216-B-3C	NONE INDICATED	H-6-829	H-6-5309	H-6-706 #3	H-6-418	H-6-485			
216-E-25	NONE INDICATED	NONE INDICATED							
UN-200-E-14	NONE INDICATED	H-2-44500 #4							
UN-200-E-92	NONE INDICATED	H-2-44500 #4							
UPR-200-E-34	NONE INDICATED	H-2-44500 #4							
UPR-200-E-51	NONE INDICATED	H-2-44500 #4							

Table B-12. List of Photographs and Selected Technical Drawings for Operable Unit 200-SS-1.

Site	Photograph	Key Drawing	Other Selected Drawings		
200E POWERHOUSE	NONE INDICATED	H-2-44501 #51			
2101-M POND	NONE IDICATED	NONE INDICATED			
218-E-3	122440-209-CN	H-2-44501 #11	H-2-34761	M-2600-E #19	H-2-44500 #7
2607-E0	NONE INDICATED	W-71192	BOVAY, 1991		
2607-E1	NONE INDICATED	W-71192	BOVAY, 1991		
2607-E11	NONE INDICATED	W-71192	BOVAY, 1991		
2607-E2	NONE INDICATED	W-71192	BOVAY, 1991		
2607-E8	NONE INDICATED	W-71192	BOVAY, 1991		
2607-EK	NONE INDICATED	W-71192	BOVAY, 1991		
2607-EM	NONE INDICATED	W-71192	BOVAY, 1991		
2607-EN	NONE INDICATED	W-71192	BOVAY, 1991		
2607-EP	NONE INDICATED	W-71192	BOVAY, 1991		
2607-EQ	NONE INDICATED	W-71192	BOVAY, 1991		
2703-E HWSA	NONE INDICATED	BOVAY, 1991			
2704-E HWSA	NONE INDICATED	BOVAY, 1991			
2715-EA HWSA	NONE INDICATED	BOVAY, 1991			
C.T.F.N. 2703-E	NONE INDICATED	H-2-44501 #63			

Table B-13. List of Photographs and Selected Technical Drawings for Operable Unit 200-IU-6.

Site	Photograph	Key Drawing	Other Selected Drawings			
216-A-25	122440-19-CN	H-2-3325	H-2-34761	H-2-450	H-2-3330	H-3-57210
216-A-25	109678-1-CN	NONE INDICATED				
216-A-25	8507223-14-CN	NONE INDICATED				
216-A-25	88081923-45-CN	NONE INDICATED				
216-N-8	122440-23,24-CN	NONE INDICATED				
UPR-200-E-34	NONE INDICATED	NONE INDICATED				

APPENDIX C

SUMMARY OF EBASCO AND HART CROWSER TECHNICAL LIBRARY HOLDINGS

NOTES: The abbreviations in the location (LOC) column refer to the following technical or project libraries:

TBS Technical Baseline Study Library located at the Ebasco Office in Richland, WA

HC The Hart Crowser Library in Seattle - a duplicate copy is usually maintained in the Richland, WA office of Hart Crowser.

BLVE The Hanford Project technical library in the Bellevue, WA office of Ebasco

ETC Energy Resource Center library located in the 450 Hills offices of Westinghouse

WIDS Waste Information Data System library, located in the 450 Hills offices of Westinghouse, next to the Energy Resource Center library. This is not a lending ibrary. No documents may be removed from the library; however, arrangements have been made to obtain photocopies of needed documents.

DEN The S Plant project files in the Denver Office of Ebasco

Summary of Ebasco/Hart Crowser library holdings and requested documents
as of: 11/15/91

NUMBER	TITLE	AUTHOR	PUBDATE	LOC	REMARKS
	AN INVENTORY OF CHEMICAL WASTES AND DISPOSAL SITES AT HANFORD	ENGLISH,MERCER	1984		
	CAD FILE OF BASEMAP OF 200-UP-2 OPERABLE UNIT			BLVE	
	COMP OF RAD LIQ WASTES DISCHARGED TO GRND, AUTHORS & NUMBERS VARY	LAW	1991		NAOMI
	GEOLOGY-HYDROLOGY SUMMARY	ROHAY	1991	BLVE	
	GROUND-WATER MAPS OF THE HANFORD SITE SEPARATIONS AREA DEC 1987	SHATZ,AMMERMAN	1988	BLVE	
	GROUND-WATER MAPS OF THE HANFORD SITE SEPARATIONS AREA JUNE 1988	SHATZ,McELROY	1988	BLVE	
	GROUNDWATER MAPS OF THE HANFORD SITE SEPARATIONS AREA	KASZA,SCHATZ	1989	BLVE	
	GROUNDWATER MONITORING PLAN FOR THE 216-S-10 DITCH AND POND	WHC		BLVE	
	HAND DRAWN EXERPTS,"Z PLANT EFFLUENTS"	ANONYMOUS			
	INTERIM CHARAC RPRT, 200-AREA LOW-LEVEL BURIAL GRND DET LEV MON	LAST,ET AL	12/1988	HC,DEN	
	INVESTIGATIONS ON THE SUBSURFACE DISPOSAL OF WASTE EFFLUENTS AND	WILSON	1971	BLVE	
	MATERIALS SHIPMENTS INTO /OUT OF PFP				
	OPERATING SPECS FOR PFP, CH-TRU SOLID WASTE DISPOSAL	THOMPSON	15 MAY 87		
	RADIONUCLIDE DISTRIBUTIONS AROUND LOW-LEVEL WASTE POND AND DITCH	LAST	1983	BLVE	
	RECHARGE ESTIMATES FOR THE HANFORD SITE 200 AREAS PLATEAU	ROUTSON,JOHNSON	1990		JENNIFER
	REGISTRATION OF HANFORD SITE CLASS V UNDERGROUND INJECTION WELLS	DOE	1988	HC	
	REV. OF HIST. EVIDENCE OF CARBON TET DEP. TO SOIL AT Z PLANT,200W	DeFORD	1991	HC	NAOMI
	RINGOLD FRMATN OF PLEISTOCENE AGE IN THE TYPE LOCAL, WHITE BLUFFS	NEWCOMB	1958		JENNIFER
	SOIL SURVEY FOR BENTON COUNTY AREA, WASHINGTON	UDSA	1971	BLVE	
	THE USE OF GEOPHYS & GEOCHEM TO CONFIRM GEO INTERPRETATIONS	BROWN	1960		JENNIFER
	UP2ALL.WRI AND UP2PLUS WRI-BOREHOLE DATA FOR VADOSE & UNCONFINED	ROHAY (WHC)		BLVE	
	WELL LOCATION MAP FOR 200-WEST AREA			BLVE	
#72-50	UNPLANNED RELEASE REPORT ???			TBS	FILED WITH WIDS FILES
#75-84	UNPLANNED RELEASE REPORT ???			TBS	FILED WITH WIDS FILES
#77-123	UNPLANNED RELEASE REPORT ???			TBS	FILED WITH WIDS FILES
17524-91-068	UNDERGROUND INJECTION WELLS	OLDHAM	07/1991	TBS	
25320-91-048	NUM SIM OF FLOW & TRANS FROM A LOW-LEVEL SOLID WST BUR GRND 200 W	KHALEEL,LU,LEWIS	1991	HC	
65462-80-035	INTERNAL LETTER, 9/10/80, DESC OF WASTE BURIED IN SITE 218-W-4B	ROCKWELL	1980	HC	
65462-80-036	INTERNAL LETTER, 9/10/80, DESC OF WASTE BURIED IN SITE 218-W-4B	ROCKWELL	1980	HC	
65463-80-126	INTERNAL LETTER, 12/9/80, INCONSISTENCIES IN 218-W-4B SITE DATA	ROCKWELL	1980	HC	
72410-85-022	INTNL LTR, 3/20/85, ENVIR SURV & CONTROL GROUP MON REP FOR 3/85	ROCKWELL	1980	HC	
75-695				ETC	hanford geology
?? 0394-2	GROUNDWATER MAPS OF THE HANFORD SITE (DECEMBER 1990)	WHC	1990	BLVE	
??-EN-EV-004	QUARTERLY ENVIRONMENTAL RADIOLOGICAL SURVEY, 4TH QUARTER 1989	JOHNSON,HUCKFELDT	1989	BLVE	
???-SA-0019P	RADIOACTIVE LIQUID WASTES DISCHARGED TO GROUND 200 AREA DURING 73	ANDERSON	1974	BLVE	JENNIFER,NAOMI
ARH-2015 (4)	RAD CONTAMINATION IN UPR TO GROUND WITHIN CHEM SEP AREA ZONE	R E MAXFIELD	30 MAR 71	WIDS	CONTAINED IN WIDS FILES
ARH-2068	MOISTURE MOVEMENT IN THE SOILS ON THE HANFORD RESERVATION	BROWNELL ET AL	1971	BLVE,HC	
ARH-2155	RADIOACTIVE LIQUID WASTE DISPOSAL FACILITIES 200 WEST AREA	L L LUNDGREN	31 AUG 70	TBS	
ARH-2190	OUTDOOR RAD ZONES IN THE 200 WEST AREA	L L LUNDGREN		WIDS	CONTAINED IN WIDS FILES
ARH-2213	?IONUCLIDE DISTRIBUTION IN 200 AREA SEDIMENTS			TBS,DEN	

ARH 275					ordered from ETC
ARH-2757 (2)	SUMMARY OF RAD. SOLID WASTE BURIALS IN 200 AREAS DURING 1972	J D ANDERSON		ETC,DEN	have selected portions
ARH-2757 (3)	RADIOACTIVITY IN LIQ WASTE DISCHARGED FROM SEP FACILITIES 1972	J D ANDERSON	9 APR 73	ETC,WIDS,TBS	
ARH-2757 (4)	RADIOACTIVE CONTAMINATION UN. RELEASES WITHIN SEP AREAS TO 1972	H L MAXFIELD	3 APR 73	ETC, TBS	have selected portions
ARH-2757 pt 2	SUMMARY OF RADIOACTIVE SOLID WASTE BURIALS IN THE 200 AREAS-1972	ANDERSON	1973		NAOMI
ARH-2806 4 Qtr	RAD. LIQ WASTES DISCHARGED TO GROUND IN 200 AREAS DURING 1973	J D ANDERSON	1974	TBS,WIDS,DEN	BELLEVUE ALSO HAS THIS
ARH-2983	SOIL MOISTURE TRANSPORT IN ARID SITE VADOSE ZONES	ISAACSON ET AL	1974	BLVE,HC	NAOMI,RICK
ARH-3088	A PRELIMINARY SAFETY ANALYSIS OF THE BC CRIBS CONTROLLED AREA	H L MAXFIELD	JUL 1974	WIDS	CONTAINED IN WIDS FILES
ARH-780	CHRONOLOGICAL RECORD OF SIGNIFICANT EVENTS IN SEPARATIONS OPERAT-			TBS,WIDS,DEN	
ARH 790	SPECIAL STUDY- POTENTIAL COST REDUCTIONS			TBS	
ARH-947	200 AREA DISPOSAL SITES FOR RADIOACTIVE LIQUID WASTES	E. F. CURREN	1972	TBS,DEN	
ARH-CD-369-4Q	SUMMARY OF RADIOACTIVE SOLID WASTE BURIALS IN THE 200 AREAS-1975	ANDERSON	26 JUL 76	WIDS,HC	NAOMI
ARH-CD-796	RESTORATION AND STABLIZATION OF THE REDOX POND 216-S-16	P J WIATER		WIDS	CONTEINED IN WIDS FILES
ARH-LD-0127				ETC	127 thru 138 - NOT NEEDED
ARH-LD-0138				ETC	tank farm geol.
ARH-SA 0253	HYDROGEOLOGY OF THE UPPERMOST CONFINED AQUIFERS UNDERLYING HANFOR	LEDGERWOOD,DEJU	1976	BLVE,HC	
ARH-ST-123	WEST. HAN. CO ENVIR. SURVEILLANCE ANN. RPT - 200/600 AREAS CY 88	WESTINGHOUSE	1988	DEN,HC	
ARH-ST-123 201	SOIL MOISTURE TRANSPORT IN ARID SITE VADOSE ZONES	BROWNELL,BACKER,ISAACSON,BROWN	JUL 1975	HC	
ARH-ST-156 (1-3)	EVALUATION OF SCINTILLATION PROBE PROFILES 200 AREA CRIB M. WELLS	K R FECHT,LAST, PRICE		TBS,DEN	HAVE V. 1 NEED 2 AND 3
ARH-ST-156 V 1-3	EVAL OF SCINTILLATION PROBE PROFILES FROM 200 AREA CRIB MON WELLS	FECHT,LAST,PRICE	06/1977	HC	GERRY, WE HAVE VOL. 2 & 3
BNW-49755-44					ordered from ETC
BNWL-1738	THE USE OF HANFORD WASTE PONDS BY WATERFOWL AND OTHER BIRDS	FITZNER,PRICE	1973	HC,BLVE	NAOMI
BNWL-2298				ETC	reviewed - no copy
BNWL-B-360	SELECT WTR TBL CONTOUR MAPS & WELL HYDROGRAPHS FOR HANFORD 44-73	KIPP,MUDD	1974	HC	JENNIFER
D0101WP0402				TBS	FILED WITH WIDS FILES
DOE-EH-OEU-05-P	ENVIRONMENTAL SURVEY PRELIMINARY REPORT HANFORD,WA AUGUST 1987			TBS,DEN	
DOE-RL	PRELIM ASSMNT/SITE INSPEC ACT ON INACTIVE WST SITES AT HANFORD	USDOE	04/1988		LTR ONLY REF PNL-6456
DOE-RL-91-45	HANFORD SITE BASELINE RISK ASSESSMENT METHODOLOGY	DOE	1991	HC,BLVE	
DOE/EIS-0113	DRAFT EIS - DISP OF HANFORD DEF HIGHLEVEL,TRANSURANIC, & TANK WST	USDOE	MAR 1986	HC	
DOE/RC-91-03	ANNUAL REPORT FOR RCRA GROUNDWATER MONITORING PROJECTS AT HANFORD		1991	DEN	ONLY HAVE PORTIONS OF DOC
DOE/RL-88-21	HANFORD SITE DANGEROUS WASTE PART A PERMIT APPLICATION	DOE-RL	1988	HC	
DOE/RL-88-30	HANFORD SITE WASTES MANAGEMENT UNITS REPORT	CRAMER	1987	HC	SELECTED PARTS IN WIDS FI
DOE/RL-91-01	HANFORD FED FAC AGRMT & CONSENT ORD QRTRLY PROG REP FOR 1990	DOE	1991	HC	
DOE/RL-91-03	ANNUAL REPORT FOR RCRA GROUNDWATER MONITORING PROJECTS 1990	DOE	FEB 1991	TBS	
DOE/RL-91-44	DESCRIPTION OF CODES & MODELS TO BE USED IN RISK ASSESSMENT	USDOE	09/1991	HC	NAOMI
DOE/RL-9104	HANFORD SITE PAST PRACTICE INVESTIGATION STRATEGY	DOE/RL	08/1991	HC	
DOE/RW-0164	SITE CHARACTERIZATION PLAN, REF REPOSITORY LOC, HANFORD SITE	USDOE	01/1988	HC	RICK
DUH-1135	DISPOSAL OF PROCESS WASTES FROM 224 BUILDING	L. SQUIRES	22 MAY 44	TBS	NOT AVAIL. FOR PUBLIC REL
DUH-1169	HANDLING OF WASTES FROM 205 BUILDING	W Q SMITH	23 MAY 44	TBS	NOT AVAIL. FOR PUBLIC REL
DUH-1347	WASTE DISPOSAL FROM 224 BUILDING	L SQUIRES	5 JUN 44	TBS	NOT AVAIL. FOR PUBLIC REL
DUH-1390	200 AREA WASTE DISPOSAL	J.A. LIST	5 JUN 44	TBS	NOT AVAIL. FOR PUBLIC REL
DUH-1452	200 AREA WASTE DISPOSAL	J.A. LIST	9 JUN 44	TBS	NOT AVAIL. FOR PUBLIC REL
DUH-575	SEPARATION AND RECOVERY OF 49 CLINTON LABORATORIES WASTE DISPOSAL	ANONYMOUS	4 DEC 43	TBS	NOT AVAIL. FOR PUBLIC REL
DUH-995	WASTE DISPOSAL -- BUILDING 224	J B. COLE	9 MAY 44	TBS	NOT AVAIL. FOR PUBLIC REL
EGG-10617-1062	AN AERIAL RADIOLOGICAL SURVEY OF THE HANFORD SITE & SURROUNDINGS			TBS	

EPA/540/4-89/05				ETC	REVIEWED - NOT NEEDED
EPA/540/G-87/003	DATA QUALITY OBJECTIVES FOR REMEDIAL RESPONSE ACTIVITIES	EPA	1987	HC	NAOMI
ERDA-1538	WASTE MANAGEMENT OPERATIONS, HANFORD RESERVATION, 2 VOL	U S ERDA	DEC 1975	WIDS	INFO IN WIDS HARDFILES
FDM-T-200-00002	241-AN TANK FARM FACILITIES DESCRIPTION MANUAL	DR GROTH	8 NOV 82	TBS	
HEHF-45				ETC	reviewed - no copy
HEW-7096-DEL	HANFORD ENGINEER WORKS MONGHLY REPORT -- JUNE 1947	ANONYMOUS	15 JUL 47	TBS	management/acct. numbers
HI-HI-0003	SOIL SURVEY, BENTON COUNTY AREA, WASHINGTON	USDOA	07/1971	HC	
*HRA-947					ordered from ETC
HRO-BWSA-0217P				ETC	history & hydro
HW-17088	THE UNDERGROUND DISPOSAL OF LIQUID WASTES AT THE HANFORD WORKS,WA	BROWN,RUPERT	1950	BLVE,HC	
HW-20195	RAD. CONTENT OF STORED BISMUTH PHOSPHATE 1ST CYC WASTE SUPERNATA.	R.E BURNES	5 FEB 51	TBS	NOT AVAIL. FOR PUBLIC REL
HW-20497	200 AREAS WASTE STORAGE ANALYSIS	W.N. MOBLEY	28 FEB 51	TBS	NOT AVAIL. FOR PUBLIC REL
HW-27035	CRIB WASTES FROM 221-T AND 224-T	J.F. HONSTEAD	17 FEB 53	TBS	NOT AVAIL. FOR PUBLIC REL
HW-31517					ETC COULD NOT LOCATE
HW-32978	ADSORPTION OF RAD ISOTOPES BY SOIL FROM A BISMUTH PHOSPHATE WASTE	RHODES, HOLTZINGER, & McHENRY	1 SEP 54	TBS	NOT AVAIL. FOR PUBLIC REL
HW-33305	TABULATION OF RADIOACTIVE LIQUID WASTE DISPOSAL FACILITIES	HV CLUKEY	8 OCT 54	TBS, WIDS	
HW-33306					ETC COULD NOT LOCATE
HW-33499	JUSTIFICATION FOR T PLANT FIRST CYCLE WASTE SCAVENGING	D E PETERSON	22 OCT 54	TBS	NOT AVAIL FOR PUBLIC REL
HW-33962					C L A S S I F I E D
HW-33979	MANUFACTURING DEPT RAD INVESTIGATION	M L SHORT	15 NOV 54	WIDS	
HW-34052	WASTE TANK SCHEDULING FOR B AND T PLANTS	D E. PETERSON	9 DEC 54	TBS	NOT AVAIL. FOR PUBLIC REL
HW-36781	PROPOSED COATING REMOVAL WASTE EXPERIMENTAL CRIB	R E BURNS	12 MAY 55	TBS	NOT AVAIL. FOR PUBLIC REL
HW-36840	SCOPE FOR SLUDGE DISP. FAC. 221-T 2D CYC, 5-6/224 WASTES 241-T-TF	illegible on document	17 JUN 55	TBS	NOT AVAIL. FOR PUBLIC REL
HW-38288	ADDITIONAL WASTE STORAGE TANKS	D.E PATERSON	25 JUL 55	TBS	NOT AVAIL. FOR PUBLIC REL
HW-41535	UNCONFINED UNDERGROUND RAD WASTE AND CONTAMINATION IN 200 AREAS	KR HEID	17 JAN 56	TBS,DEN	
HW-42612	COBALT-60 IN GROUNDWATER SEPARATIONS PLANT WASTE STREAMS	THOMAS ET AL	1956	BLVE,HC	
HW-43121	TABULATION OF RADIOACTIVE LIQUID WASTE DISPOSAL FACILITIES	HV CLUKEY	10 MAY 56	ETC, WIDS	signed out by D Deford
HW-45058	REV OF RAD LIQ WASTE DISP PRAC FOR HANFORD SEPARATIONS PLANTS	CLUKEY,HANEY		HC,DEN	
HW-48916	HYDRAULIC CHARACTERISTICS OF HANFORD AQUIFERS	BIERSCHENK	1957	BLVE,HC	
HW-51277	CHANGES IN THE HANFORD WATER TABLE 1944-1957	BIERSCHENK,McCONIGA		BLVE,HC	
HW-53218	PROPERTIES OF SOILS OF THE HANFORD PROJECT	McHENRY	1957	BLVE,HC	
HW-53599	FLUCTUATIONS OF HANFORD WATER LEVELS	BIERSCHENK	1957	HC,BLVE	JENNIFER
HW-54636	SUMMARY OF ENVIRON CONTAMINATION INCIDENTS @ HANFORD 1952-1957	SELBY,SOLDAT	01/1958	HC,DEN	
HW-55176 (1-77)	INDEX OF CPD CRIB BLDG NUMBER DESIGNS OF CPD RAD LIQ WASTE SITES	E DOUD	22 OCT 59	ETC,WIDS	signed out by D Deford
HW-57830	ISOLATION OF ABANDON OF DEPLEATED WASTE DISPOSAL SITES	R C TABASINSKI	14 NOV 58	TBS,WIDS	
HW-60601	AQUIFER CHARACTERISTICS AND GROUNDWATER MOVEMENT AT HANFORD	BIERCHENK	1959	HC	JENNIFER
HW-60807	UNCONFINED UNDERGROUND RADIOACTIVE WASTE CONTAMINATION IN 200 ARE	BALDRIDGE	1959	HC	
HW-61780	SUBSURFACE GEOLOGY OF THE HANFORD SEPARATION AREAS	BROWN	1959	BLVE,HC	
HW-66147	INVENTORY OF RAD LIQ WASTE TO GRND. IN THE 200 AREAS 1945-1959	BROWN,McCONIGA	07/1960	HC,DEN	
HW-66289	AN INTRO TO THE SURFACE OF THE RINGOLD FORMATION BENEATH HANFORD	BROWN	1 AUG 60	HC	JENNIFER
HW-67549	AN EOLIAN DEPOSIT BENEATH THE 200 WEST AREA	BROWN	1960	BLVE,HC	
HW-67729	GEOLOGY UNDERLYING THE 200-AREA TANK FARMS	BROWN	22 DEC 60	TBS,DEN	JENNIFER
HW 7-5194-DEL	HANFORD ENGINEER WORKS MONTHLY REPORT SEPTEMBER 1946	ANONYMOUS	16 OCT 46	TBS	
HW 72182 SHT 2	TANK FARM 241-U PLOT PLAN	DRAWING		WIDS	INFO IN WIDS HARDFILES
HW-7402	[illegible]DGE LEVEL OF METAL WASTE TANKS, 101 T, 102 T, AND 103 T	R A [illegible]GREN	28 AUG 47	TBS	NOT AVAIL FOR PUBLIC

HW 7775	DETERMIN. OF SLUDGE DEPTHS IN TKS 241 T 361 & 241-T-201 & CHECK	P G RHODES	8 OCT 47	TBS	NOT AVAIL. FOR PUBLIC REL
HW-7776	SLUDGE LEVEL OF METAL WASTE TANKS 101-T, 102-T, AND 103-T	P G RHODES	8 OCT 47	TBS	NOT AVAIL. FOR PUBLIC REL
HW-83718	200 AREAS DISPOSAL SITES FROM RAD. LIQUID WASTES	E POND	31 JUL 64	TBS,WIDS,DEN	
HW-9671	UNDERGROUND WASTE DISPOSAL AT HANFORD WORKS. INTERIM REPORT 200W	RE BROWN, HG RUPERT	3 MAY 48	BLVE,TBS,HC	NAOMI
ISO-656	PROJECT PROPOSAL WASTE DISPOSAL CRIB 216-T-36	ISOCHEM	6 FEB 67	TBS	
ISO-SA-31	WASTE DISPOSAL INTO THE GROUND AT HANFORD	S J BEARD, WL GODFREY		TBS,DEN	
Inspection Rpt	RETIRED FACILITIES INSPECTION REPORT			TBS	
KH-124523	GROUNDWATER AND THE BASALTS IN THE PASCO BASIN	R E BROWN		TBS	
OSD-Z-184-00010	OPERATING SPECIFICATIONS FOR 241-Z WASTE FACILITY	STROUP	18 JUL 84		NAOMI
PFD-Z-180-00006	PLUTONIUM FINISHING PLANT CHEMICAL SEWER FLOWSHEET	LUST	DEC 1986		NAOMI
PNL-2724	VERTICAL CONTAMINATION IN THE UNCONFINED GROUNDWATER AT HANFORD	EDDY ET AL	1978	BLVE,HC	RICK
PNL-3212	RAPTORS ON THE HANFORD SITE & NEARBY AREAS OF S. CENTRAL WASH.	FITZNER,ET AL	05/1981	HC,DEN	
PNL-3504	CATALOG OF BOREHOLE GEOPHYSICS ON THE HANFORD SITE 1958-1980	BLAIR,LAW,LINDBERG	03/1981	HC	RICK
PNL-4622	CLIMATOLOGICAL SUMMARY FOR THE HANFORD AREA	STONE,ET AL	06/1987	HC,DEN	
PNL-4773	RADIONUCLIDE MIGRATION IN GROUNDWATER	ROBERTSON,TOSTE,ABEL	1982	BLVE,HC	
PNL-5275	ENVIRONMENTAL CHARACTERIZATION OF TWO POTENTIAL LOCATIONS FOR NEW	WATSON ET AL	1984	BLVE,HC	
PNL-5428	UNSATURATED WATER FLOW AT THE HANFORD SITE. REVIEW OF LITERATURE	GEE,HELLER	1985	BLVE,HC	RICK
PNL-5506	HANFORD SITE WATER TABLE CHANGES 1950 THROUGH 1980	ZIMMERMAN ET AL	1986	BLVE,HC	
PNL-5895	WELL NTWRK & MSRMNT SCHED FOR MON WTR-LVL CHANGE UNDER SEP AREAS	LAST,ET AL	08/1990	HC,DEN	
PNL-6120	ENVIRONMENTAL MONITORING AT HANFORD FOR 1986	PNL	1987	BLVE,HC	
PNL-6313	AN EVALUATION OF AQUIFER INTERCOMMUNICATION BETWEEN THE UNCONFINE	JENSEN	1987	BLVE,HC	
PNL-6315-1	HANFORD SITE GROUNDWATER MONITORING FOR APRIL THROUGH JUNE 1987	EVANS ET AL	1988	BLVE,HC	
PNL-6328	ESTIMATION OF GROUND-WATER TRAVEL TIME AT THE HANFORD SITE	FRESHLEY,GRAHAM	1988	BLVE,HC	
PNL-6403	RECHARGE AT THE HANFORD SITE: STATUS REPORT	GEE	1981	BLVE,HC	RICK
PNL-6456	INACTIVE WASTE SITES AT HANFORD	STENNER, et al	1988	HC	
PNL-6456 VOL 1	HAZARD RANKING SYSTEM EVALUATION OF CERCLA INACTIVE WASTE SITES	STENNER, CRAMER, HIGLEY, JETTE	1988	DEN,HC	NAOMI
PNL-6464	ENVIRONMENTAL MONITORING AT HANFORD FOR 1987	PNL	1988	BLVE,HC	
PNL-6488	CHARACTERIZATION OF UNSATURATED HYDRAULIC COND. AT HANFORD SITE	ROCKHOLD, FAYER, GEE	1989	HC	RICK
PNL-6734	REV OF HIST DATA ON RAD CONTENT OF SOIL SAMPLES COL@ HANFORD SITE	PRICE	11/1988	HC,DEN	
PNL-6820	HYDROGEOLOGY OF THE 200 AREAS LOW-LEVEL BURIAL GROUND VOL. 1-4	LAST ET AL.	1989	BLVE,HC	RICK
PNL-6825	HANFORD SITE ENVIRONMENTAL REPORT FOR CALENDAR YEAR 1988	JAQUISH,BRYCE	1989	BLVE,HC	
PNL-6907	HANFORD WELLS 1989	McGHAN	06/1989	HC	RICK
PNL-6964	A HISTORY OF MAJOR HANFORD OPERATIONS INVOLVING RAD. MATERIALS	BALLINGER, HALL	1989	HC	
PNL-6992	TRENDS IN RADIONUCLIDE CONCENTRATIONS FOR SELECTED WILDLIFE 71-88	EBERHARDT,CADWELL,PRICE	1989	BLVE,HC	NAOMI
PNL-7102	A DEMO OF THE APPLIC OF IMPLEMNTG ENHANCD REM ACT PRIORITY SYS	WHELAN,ET AL	12/1989	HC	
PNL-7215	NATURAL GROUNDWATER RECHARGE AND WATER BALANCE AT HANFORD SITE	ROCKHOLD,FAYER,GEE,KANYID	1990	DEN,HC	RICK
PNL-7346	HANFORD SITE ENVIRONMENTAL REPORT FOR CALENDER YEAR 1985			TBS	
PNL-7396	HANFORD SITE GROUND WATER SURVEILLANCE FOR 1989	EVANS,BRYCE,KEMNER	1990	HC	RICK
PNL-7471	CLIMATOLOGICAL SUMMARY OF WIND & TEMP DATA FOR THE HANFORD NETWOR	GLANTZ,ET AL	09/1990	HC,DEN	
PNL-7572	SINGLE-SHELL TANK CONSTITUENT RANKINGS FOR USE IN PREP WASTE PLAN	DROPPO JR ,ET AL	06/1991	HC	
PNL-7600 (2)	PNL ANNUAL REPORT FOR 1990 TO THE DOE OFFICE OF ENERGY RESEARCH	PNL STAFF		HC,DEN	
PNL-7660	COMPILTN OF DATA TO EST GW MIGRTN POTNTL FOR CONSTITUENTS IN LIQ	AMES, SERNE	1991	HC	JENNIFER,NAOMI
PNL-MA-558	HANFORD GRNDWTR DATABASE MNGMNT GUIDE 1990, REV EXIST COND/ANAL R		1990	HC	RICK
PNL-MA-588 (1-4)	RESOURCE BOOK- DISPOSITION OF RETIRED CONTAMINATED FAC. @ HANFORD	K M HARMON, ET AL	AUG 1975	ETC,WIDS	database manual
PNL-MA-88	* * * THIS DOCUMENT MAY HAVE BEEN RENUMBERED * * * *				ordered from ETC

BHI00179.R00/V

PNL-SA-7717	TRANSPORT OF RADIONUCLIDES THROUGH UNSATURATED SANDY SOILS	GEE,CAMPBELL	08/1979	HC,DEN	
RHO-ST-17	DIST OF PLUTONIUM & AMERICIUM BENEATH 216-Z-1A CRIB: A STATUS REP	PRICE,ET AL	02/1979	HC	NAOMI,RICK,DAN - URGENT
RHO-BW-SA-563A	QUARERNARY STRATIGRAPHY OF THE PASCO BASIN AREA, SOUTH-CENT. WASH	BJORNSTAD,FECHT,TALLMAN	1987	BLVE	
RHO-BWI-C-0069				ETC	REVIEWED - NOT NEEDED
RHO-BWI-LD-20	PRELIMINARY DESCRIPTION OF HYDROLOGIC CHARACTERISTICS & TRANSPORT	DEJU,FECHT	1979	BLVE,HC	
RHO-BWI-SA-0161A				ETC	geophysics
RHO-BWI-ST-5	HYDROLOGIC STUDIES WITHIN COLUMBIA PLATEAU, WASHINGTON	GEPHART,ARNETT,BACA,LEONHART	1979	HC	
RHO-BWO-SA-0179				ETC	historical
RHO-CD-1048	CURRENT STATUS OF OUTDOOR RAD AREAS IN THE 200 AREAS	R L MORTON	AUG 1980	TBS, WIDS	
RHO-CD-1078	SOLUTE TRANSPORT FOR RAD WASTE THROUGH THE VADOSE ZONE	LU	09/1980	HC,DEN	
RHO-CD-27-3Q	SUMMARY OF RADIOACTIVE SOLID WASTE BURIALS IN THE 200 AREAS-1977	ANDERSON,POREMBA	1978	HC	NAOMI
RHO-CD-673	200 AREA WASTE SITES, 3 VOLUMES	H L MAXWELL	1 APR 79	WIDS	INFO IN WIDS HARDFILES
RHO-CD-673	HANDBOOK - 200 AREA WASTE SITES	MAXFIELD	1979	HC	INFORMATION IN WIDS FILES
RHO-CD-78	ASSESSMENT OF HANFORD BURIAL GROUNDS AND INTERIM TRU STORAGE	BROWN, GEIGER, ISAACSON	1977	HC	
RHO-CD-798	CURRENT STATUS OF 200 AREA PONDS	MEINHARDT,FROSTENSON	NOV 1979	TBS,WIDS,DEN	
RHO-CD-827	VOL OF CONTAMINATED SOIL IN LONGTERM TRU WASTE SITES AT HANFORD	M A NELSON	FEB 1980	TBS,WIDS,DEN	
RHO-HS-EV-9	EXTRAPOLATION OF RESULTS FROM THE 216-B-5 REVERSE WELL STUDY	A G LAW, A H LU		TBS	
RHO-HS-SA-19P	RAD DIST AROUND A LOW LEVEL RAD WASTE DISPOSAL POND AND DITCH	G V LAST	03/1983	TBS,DEN,HC	REC FROM EBASCO 11/1/91
RHO-HS-SR-84-3 4	RAD. LIQ. WASTES DISCHARGED TO GROUND IN THE 200 AREAS DURING 84	ALDRICH, R C.	1984	DEN, TBS	
RHO-HS-SR-85-13P	ROCKWELL HANFORD OPERATIONS ENVIRONMENTAL SURVEILLANCE RPT- 1985	ELDER,CONKLIN,BREKKE,EGERT,	1986	BLVE,HC	NAOMI
RHO-HS-SR-86-13P	ROCKWELL HANFORD OPERATIONS ENVIRONMENTAL SURVEILLANCE RPT- 1986	ELDER,EGERT,JOHNSON,OSBORNE	1987	BLVE,HC	NAOMI
RHO-HS-ST-10	HISTORICAL TIMELINES OF HANFORD OPERATIONS	BRAHSON	1987	HC	
RHO-LD-114	EXISTING DATA FOR THE 216-Z LIQUID WASTE SITES	OWENS	1981	WIDS,HC	
RHO-LD-42	LONG TERM MANAGEMENT OF LOW LEVEL WASTES TECH DEV PROG PLAN	H A BURY, C W MANRY		TBS	
RHO-LD-71	STRATIGRAPHY OF THE LATE CENOZOIC SEDIMENTS 216-A CRIB FACILITIES			TBS,DEN	
RHO-LD-78-24-4Q	SUMMARY OF RADIOACTIVE SOLID WASTE BURIALS IN THE 200 AREAS-1978	ANDERSON,POREMBA	1979	HC	NAOMI
RHO-LD-80-24-4Q	SUMMARY OF RADIOACTIVE SOLID WASTE BURIALS IN THE 200 AREAS-1980	ANDERSON,POREMBA	1981	HC	NAOMI
RHO-LD-81-24-4Q	SUMMARY OF RADIOACTIVE SOLID WASTE BURIALS IN THE 200 AREAS-1981	ANDERSON,POREMBA,McCANN	1982	HC	NAOMI
RHO-RE-EV-81P	PRELIM DESIGNATION /LIQUID WASTE DISCHRGE TO GROUND IN 200 AREA	FLYCKT,& JUNGGLEISCH			
RHO-RE-SR-24P	RESULTS OF THE SEPATATIONS AREA GROUND-WATER MONITORING 1986	LAW,SERKOWSKI,SCHATZ	1987	BLVE,HC	
RHO-RE-SR 8694-Q	SUMMARY OF RADIOACTIVE SOLID WASTE BURIALS IN THE 200 AREAS-1986	ANDERSON,POREMBA,McCANN	1987	HC	
RHO RE-SR-87-24P	RESULTS OF SEPARATIONS AREA GROUND-WATER MONITOR. NETWORK FOR 83	A.G LAW AND R.M ALLEN	JUL 1984	ETC,WIDS	reviewed - no copy
RHO-REST-0012P				ETC	hydrogeology
RHO-SA-131	TRANS DISTRIBUTION BENEATH A RETIRED U G DISPOSAL FACILITY	KASPER,ET AL	1979	HC	NAOMI,RICK,DAN - URGENT
RHO-SA-224	FIELD STUDY OF PLUTONIUM TRANSPORT IN THE VADOSE ZONE	KASPER	11/1981	ETC	expl no GW con
RHO-SR-23	GEOLOGY OF THE SEPARATION AREAS	TALLMAN ET AL	1979	BLVE	
RHO-ST-21	REPORT ON PLUTONIUM MINING ACTIVITIES AT 216-Z-9 ENCLOSED TRENCH	LUDOWISE	1978	HC	
RHO-ST-23	GEOLOGY OF THE SEPARATIONS AREAS, HANFORD SITE, S CENTRAL WASH	TALLMAN,FECHT,MARRATT,LAST	06/1979	HC	
RHO-ST-37	216-B-5 REVERSE WELL CHARACTERIZATION STUDY	SMITH	1980	HC	
RHO-ST-42	HYDROLOGY OF THE SEPARATIONS AREA	GRAHAM	1981	BLVE,HC	RICK
Reference List	TANK FARM REFERENCE LIST	TANK FARM MANAGER	1991	TBS	
SD-DD-FL-001	RETIRED FACILITIES CATEGORY LISTING			TBS	
SD-RE-AR-003	HANFORD GENERIC REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLN	CRAMER	01/1988	HC,DEN	
SD RE-RPS-001	ANNUAL STABILIZATION PROGRESS REVIEW AND STATUS REPORT - FY 1981	J A WINTERHALDER	30 NOV 81	WIDS	INFO IN WIDS HARDFILES
SD-SQA EV-200020	8 ENVIRONMENTAL RADIOLOGICAL SURVEY SUMMARY FOR JULY 1988	OSDC JOHNSON	1988	HC,BLVE	

SD WH CR-009	CONST DES CRITERIA - REPLAC DISP FACIL FOR 216-S 19P INFLUEN	J.A. WINTERHALDER	7 OCT 83	WIDS	INFO IN WIDS HARDFILES
SD-WH-TI-302	HANFORD WASTE TANK SLUICING HISTORY			TBS	
SDR-ER-TI-0003				ETC	REVIEWED - NOT NEEDED
UCRL-53953	BASELINE PUBLIC HEALTH ASS. FOR CERCLA INVEST AT LLNL LIVERMORE	LAYTON/DANIELS/ISHERWOOD		HC	
UNNUMBERED	BIOLOG ASSESSMT FOR CHARAC ACT. OF THE 100,200, & 300 OPER UNITS	FITZNER,WEISS	09/1991	HC	NOT AVAIL FOR PUBLIC REL
UNNUMBERED	GEOLOGY OF THE 200 WEST AREA	LINDSEY	10/1991	HC	RICK
UNNUMBERED	GEOPHYSICAL & SURFACE GEOPHYSICS DATA PACKAGE FOR U-PLANT	PNL	10/1991	HC	
UNNUMBERED	PRELIMINARY SUMMARY REPORT OF THE DEFENSE PRODUCTION FACILITIES	USDOE	09/1988	HC	
UNNUMBERED	RADIOLOGICAL HISTORY OF THE PUREX FACILITY 1955 TO 1989	HODGES	08/1989	TBS	
UNNUMBERED	REFERENCE LIST -- ENERGY RESOURCE CENTER HOLDINGS	ERC	1991	TBS	
UNNUMBERED	RETIRED FACILITIES QUARTERLY INSPECTION REPORT 2ND QRT FY82			TBS	
UNNUMBERED	WASTE INFORMATION DATA SYSTEM, AN AUTOMATED MGMT INFORMATION SYS	WIDS	1991	HC	ALSO SEE WHC-MR-056
UNNUMBERED	WASTE INFORMATION DATABASE SYSTEM BIBLIOGRAPHY	NANCY HOMAN	15 MAY 91	TBS	REFERENCE LIST FOR WIDS
UNNUMBERED	WELL COMPLETION LOGS - SELECTED Z-PLANT WELLS	PNL	11/08/91	HC	
UNNUMBERED	WHITE PAPER, LEAD IN 218-W-5 BURIAL GROUND	ROCKWELL	1986	HC	
UNPUBLISHED	ALIASES MASTER LIST, UNPUBLISHED PAPER OBTAINED FROM WIDS	ANONYMOUS	1991	TBS,BLVE	
UNPUBLISHED	DRAFT 200-AREA SANITARY WASTE DISP SYS.SURVEY & INTERIM SOLUTIONS	BOVAY NORTHWEST	08/1991	TBS	NOT AVAIL FOR PUBLIC REL
UNPUBLISHED	EXPLANATION OF THE UN / UPR NOMENCLATURE DEFINED BY WIDS	NANCY HOMAN	1991	TBS	
UNPUBLISHED	HEALTH PHYSICS SITE MONITORING LIST	HEALTH PHYSICS		TBS	
UNPUBLISHED	HEALTH PHYSICS SITE MONITORING LIST	HEALTH PHYSICS	1991	TBS	
UNPUBLISHED	HIST. OVERVIEW OF WASTES DISP. TO SOIL COLUMN AND TANKS AT HANFOR	MICHELE GERBER	1991	TBS	
UNPUBLISHED	HISTORICAL UNPLANNED RELEASE FILE	ENVIRONMENTAL PROTECTION		TBS	
UNPUBLISHED	HISTORY OF HANFORD OPERATIONS	MICHELE GERBER	1991	TBS	
UNPUBLISHED	INTERNAL LETTER (1974) HAZARDS REVIEW - Z-8 TO 109-TX TRANSFER	RAAB, SMITHERS	20 AUG 74	HC	
UNPUBLISHED	INTERNAL MEMO INFO TO SUPPORT PFP PART A APPLICATION	RODGERS	31 JUL 87		
UNPUBLISHED	LETTER W/ ATTACHMENTS P.E. GERTON, DOE -- HANFORD WASTE TANKS	R.J. Bliss	15 Oct 90	DEN	
UNPUBLISHED	MANHATTAN PROJECT CONSTRUCTION AND HISTORIC STRUCTURES AT THE HAN	MICHELE GERBER	UNDATED	TBS	
UNPUBLISHED	REFERENCE LIST -- TANK FARM CHARACTERIZATON DATABASE	TANK FARM MANAGER	1991	TBS	
UNPUBLISHED	SEPTIC TANK LIST, SEPTEMBER 1991	BOYD,SHANNON		TBS	LST OF ALL SITE SEPTIC TK
UNPUBLISHED	SPECIAL REPORT-"LOST" WASTE SITES AT HANFORD (200 & 600 AREAS)	WA-DSHS	01/1987	TBS	
UNPUBLISHED	SYNOPTIC CHRONOLOGY OF THE HANFORD SITE	DENNIS DeFORD	1991	TBS,DEN	summary of opns since 42
UNPUBLISHED	TANK FARM MEMOS	TANK FARM MANAGER	VARIOUS	TBS	
UNPUBLISHED	WIDS UNPLANNED RELEASE CROSS REFERENCE LIST	NANCY HOMAN	1991	TBS	
USGS OFR 75-625	GEOLOGY AND HYDROLOGY OF RADIOACTIVE SOLID WASTE BURIAL GROUNDS	USGS	1975	DEN,TBS,ETC	
USGS OFS 87-222	SBSRFCE TRNSPRT OF RADIONUCLIDES IN SHLLW DEPSTS OF THE HANFORD	USGS	1987		JENNIFER
USGS PAPER-717	GEOLOGY AND GROUNDWATER CHARACTERISTICS OF HANFORD RESERVATION	USGS	1972	BLVE	
VOL2 HISS DBASE	PHASE 1 INSTALLATION ASSESSMENT OF INACTIVE WASTE DISPOSAL SITES	DOE	1986	BLVE	
WHC-EP-0052	PRELIMINARY EVALUATION OF HANFORD LIQUID DISCHARGES TO GROUND	JUNGFLEISCH	1988	BLVE,HC	NAOMI
WHC-EP-0054	HANFORD SITE WATER TABLE MAP, JUNE 1987	WHC	1987	BLVE	
WHC-EP-0067	BARRIER EROSION SONTROL TEST PLAN:GRAVEL MULCH,VEG,& SOIL WTR ACT	WAUGH,LINK	07/1988	HC,DEN	
WHC-EP-0125	SUMMARY OF RADIOACTIVE SOLID WASTE RECEIVED IN THE 200 AREAS-1987	ANDERSON,POREMBA,McCANN	1988	HC	
WHC-EP-0125-1	SUMMARY OF RADIOACTIVE SOLID WASTE RECEIVED IN THE 200 AREAS-1988	ANDERSON,POREMBA,McCANN	1989	HC	
WHC EP-0125-2	SUMMARY OF RADIOACTIVE SOLID WASTE RECEIVED IN THE 200 AREAS-1989	ANDERSON,POREMBA,McCANN	1990	HC	
WHC EP-0125-3	SUMMARY OF RAD SOLID WASTE REC. IN THE 200 AREAS DURING 1990	ANDERSON, McCANN, POREMBA	1991	HC	NAOMI
WHC EP 0125-3	SUMMARY OF RADIOACTIVE SOLID WASTE RECEIVED IN THE 200 AREAS 1990	ANDERSON,McCANN,POREMBA	1991	HC	NAOMI/DUP PLEASE REMOVE

WHC-EP-0142	GROUND-WATER MAPS OF THE HANFORD SITE SEPARATIONS AREA	WHC	1987	BLVE,HC	
WHC-EP-0142-1	GROUND-WATER MAPS OF THE HANFORD SITE SEPARATIONS AREA	SCHATZ,McELROY	09/1988	HC	
WHC-EP-0142-2	GROUND-WATER MAPS OF THE HANFORD SITE SEPARATIONS AREA	KASZA,SCHATZ	03/1989	HC	
WHC-EP-0145	WHC ENVIRONMENTAL SURVEILLANCE ANNUAL REPORT-200/600 AREAS-1987	ELDER,EGERT,JOHNSON,OSBORNE	1988	BLVE,HC	NAOMI
WHC-EP-0145-1	WESTINGHOUSE HANFORD CO. ENVIRONMENTAL SURVEILLANCE ANNUAL REPORT	ELDER,McKINNEY,OSBORNE	1989	DEN	NAOMI
WHC-EP-0145-2	WHC ENVIRONMENTAL SURVEILLANCE ANNUAL REPORT-200/600 AREAS-1989	SCHMIDT ET AL	1990	BLVE,HC	NAOMI
WHC-EP-0152	RESULTS OF GROUND-WATER MONITORING FOR RADIONUCLIDES IN SEP. AREA	SERKOWSKI,LAW,AMMERMAN,ETC	1988	TBS,DEN,BLVE	NAOMI,RICK
WHC-EP-0172	INVENTORY OF CHEM USED @ HANFORD SITE PROD PLANTS & SUPPORT OPER	KLEM	04/1990	HC,DEN	1944 TO 1980
WHC-EP-0260	OPERATIONAL GROUNDWATER MONITORING AT THE HANFORD SITE-1988	SERKOWSKI,JORDAN	1989	BLVE,HC	JENNIFER
WHC-EP-0287	WASTE STREAM CHARACTERIZATION REPORT	WHC	08/1989	HC,DEN	
WHC-EP-0342	PLUTONIUM FINISHING PLANT WASTEWATER STREAM-SPECIFIC REPORT	JENSEN	08/1990	HC	
WHC-EP-0342 (13)	222-S LABORATORY WASTEWATER STREAM-SPECIFIC REPORT		AUG 1990	DEN	ADDENDUM 13 UC-630
WHC-EP-0342 AD10	T PLANT WASTEWATER STREAM- SPECIFIC REPORT			TBS	ERC
WHC-EP-0342 ADD6	B PLANT CHEMICAL SEWER STREAM- SPECIFIC REPORT	K A PETERSON		TBS,DEN	ERC
WHC-EP-0366	LIQUID EFFLUENT STUDY: GROUND WATER CHARACTERIZATION DATA	WHC	1990	BLVE	JENNIFER
WHC-EP-0367	LIQUID EFFLUENT STUDY FINAL PROJECT REPORT	WHC	08/1990	HC,DEN	
WHC-EP-03941	GROUNDWATER MAPS OF THE HANFORD SITE	KASZA,HARRIS,HARTMAN		ETC	RICK, REVIEWED NOT NEEDED
WHC-EP-0400	TECHNICAL BASELINE REPORT (SITE HISTORIES, WASTE INVENT. & PHOTO)	DeFORD	1991	HC,BLVE	Z Plant TBS report
WHC-EP-0402	STATUS OF BIRDS AT THE HANFORD SITE IN SOUTHEASTERN WASHINGTON	LANDEEN,JOHNSON,MITCHELL	1991	BLVE,HC	NAOMI
WHC-EP-0510	BALD EAGLE SITE MGMT PLAN FOR THE HANFORD SITE, S. CENTRAL WASH	FITZNER,WEISS	10/1991	HC	
WHC-EP-0513	BIOLOGICAL ASSESSMENT - THREATENED & ENDANGERED WILDLIFE SPECIES	FITZNER,WEISS,STEGAN	10/1991	HC	
WHC-IP-0711	PROCESS AIDS - VOLUME 17 1985			HC	NAOMI
WHC-IP-0711	PROCESS AIDS - VOLUME 18 1986			HC	NAOMI
WHC-IP-0711	PROCESS AIDS - VOLUME 19 1987			HC	NAOMI
WHC-IP-0711	PROCESS AIDS - VOLUME 20 1988			HC	NAOMI
WHC-IP-0711	PROCESS AIDS - VOLUME 21 1989			HC	NAOMI
WHC-IP-0711	PROCESS AIDS - VOLUME 22 1990			HC	NAOMI
WHC-MR-0056 RV 1	WIDS DATABASE FIELD DESCRIPTIONS AND DATA	WHC	1991	HC	JENNIFER
WHC-MR-0132	A HISTORY OF THE 200 AREA TANK FARMS	J. D. ANDERSON	JUN 1990	ETC,DEN,TBS	
WHC-MR-0204	200-E & 200-W AREAS LOW-LEVEL BURIAL GROUNDS BOREHOLE SUM REPORT	GOODWIN	10/1990	HC	RICK
WHC-MR-0205	BOREHOLE COMPLETION DATA PACKAGE FOR LOW LEVEL BURIAL GROUNDS	BARTON	10/1990	HC	DAN,RICK
WHC-MR-0208	BOREHOLE COMPLETION DATA PACKAGE FOR THE 216-U-12 CRIB	GOODWIN	1990	BLVE,HC	
WHC-MR-0244	SITE SELECT PROCESS FOR EXPEDITED RESPONSE ACTION AT HANFORD SITE	JOHNSON		HC	NAOMI
WHC-MR-0246	CHARACTERIZATION AND USE OF GROUND WATER BACKGROUND HANFORD SITE	HOOVER/LEGORE -- ROHAY	1991	DEN,HC	NAOMI,RICK
WHC-MR-0270	200-BP-5 OPERABLE UNIT TECHNICAL BASELINE REPORT	JACQUES,KENT	10/1991	TBS	
WHC-SA-1252-S	MAMMAL OCCURANCE AND EXCLUSION @ THE HANFORD SITE	JOHNSON,DIEDIKER,SCHMIDT	06/1991	HC,DEN	
WHC-SD-EN-AP-023	A PROP DATA QUALITY STRATEGY FOR HANFORD SITE CHARACTERIZATION	McCAIN	01/1990	HC,DEN	
WHC-SD-EN-EE-004	REVISED STRATIGRAPHY FOR THE RINGOLD FORMATION, HANFORD SITE	LINDSEY	1991	HC	JENNIFER
WHC-SD-EN-QAPP-1	QA PROJ. PLAN FOR RCRA GROUND WATER MONIT. ACTIVITIES - 10/90		1990	DEN	
ZO-170-015 (H-0)	PFP - STANDARD PRACTICES (HNDLE & PACK SOLID WST IN 55-GAL DRUMS)		10/21/91	HC	
ZO-170-040 (B-4)	PFP - WASTE (REPACKAGE 55-GALLON DRUMS)		04/03/91	HC	
ZO-170-051 (B-2)	PFP - STANDARD PRACTICES (SAMPLE, PACKAGE, & SEAL HAZ WASTE CONT)		09/30/91	HC	
ZO-170-053 (A-3)	PFP - STANDARD PRACTICES (INSPECT, PACKAGE, & SHIP WASTE)		07/19/91	HC	

APPENDIX D

TRAC DATABASE

BHI00179.R00V

TRAC Database - Tank Farm Summaries for the 241-B Tank Farm

Total (1/1/90)	B-101 Curies	B-102 Curies	B-103 Curies	B-104 Curies	B-105 Curies	B-106 Curies	B-107 Curies	B-108 Curies	B-109 Curies	B-110 Curies	B-111 Curies	B-112 Curies	B-201. Curies	B-202 Curies	B-203 Curies	B-204 Curies
1 Ac225	2E-08	1E-08	2E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	5E-14	5E-13
2 Ac227	3E-05	9E-06	2E-05	1E-05	1E-04	8E-06	4E-05	1E-04	3E-05	2E-04	8E-04	1E-04	0E+00	2E-05	3E-12	3E-11
3. Am241	1E+02	1E+01	7E+01	4E+00	4E-01	2E-01	1E+00	5E+00	2E+00	1E+03	4E+00	4E+01	0E+00	4E+01	1E-01	1E+00
4 Am242	9E-31	4E-04	3E-02	3E-05	3E-05	3E-04	4E-05	1E-02	4E-03	3E+00	2E-04	9E-02	0E+00	0E+00	0E+00	0E+00
5. Am242m	9E-31	4E-04	3E-02	3E-05	3E-05	3E-04	4E-05	1E-02	4E-03	4E+00	2E-04	9E-02	0E+00	0E+00	0E+00	0E+00
6. Am243	3E-31	3E-04	1E-02	4E-05	5E-06	2E-04	1E-05	7E-03	2E-03	2E+00	5E-05	5E-02	0E+00	0E+00	0E+00	0E+00
7. At217	2E-08	1E-08	1E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	5E-14	5E-13
8 Ba135m	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
9 Ba137m	1E-25	2E+03	1E+04	4E+03	4E+04	2E+03	4E+04	3E+04	1E+04	6E+04	5E+05	2E+05	0E+00	0E+00	0E+00	0E+00
10. Bi210	3E-10	4E-11	5E-11	2E-11	1E-11	9E-12	6E-11	2E-10	6E-11	5E-10	3E-11	5E-11	0E+00	6E-11	1E-13	1E-12
11. Bi211	3E-05	9E-06	2E-05	1E-05	1E-04	8E-06	4E-05	1E-04	3E-05	2E-04	8E-04	1E-04	0E+00	2E-05	3E-12	3E-11
12. Bi213	2E-08	1E-08	2E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	6E-14	6E-13
13. Bi214	2E-09	2E-10	3E-10	7E-11	3E-11	4E-11	2E-10	1E-09	3E-10	2E-09	1E-10	2E-10	0E+00	3E-10	5E-13	5E-12
14. C14	5E+00	1E+00	3E+00	4E-01	1E+01	5E-01	1E+01	1E+01	7E+00	1E+02	2E+03	8E+01	0E+00	0E+00	0E+00	0E+00
15. Cm242	7E-31	4E-04	3E-02	3E-05	2E-05	3E-04	3E-05	9E-03	3E-03	3E+00	2E-04	7E-02	0E+00	0E+00	0E+00	0E+00
16 Cm244	2E-30	2E-03	2E-02	4E-06	2E-04	1E-03	4E-03	1E-01	3E-02	1E+01	1E+00	7E-01	0E+00	0E+00	0E+00	0E+00
17. Cm245	1E-34	1E-07	1E-06	8E-11	4E-09	8E-08	1E-07	6E-06	2E-06	1E-03	3E-05	5E-05	0E+00	0E+00	0E+00	0E+00
18. Cs135	3E-31	3E-02	7E-02	9E-02	6E-01	2E-02	2E-01	1E-01	6E-02	2E-01	2E+00	1E+00	0E+00	0E+00	0E+00	0E+00
19. Cs137	1E-25	3E+03	1E+04	5E+03	4E+04	2E+03	5E+04	3E+04	1E+04	6E+04	6E+05	2E+05	0E+00	0E+00	0E+00	0E+00
20. Fr221	2E-08	1E-08	2E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	5E-14	5E-13
21. Fr223	5E-07	1E-07	3E-07	1E-07	1E-06	1E-07	5E-07	2E-06	5E-07	2E-06	1E-05	1E-06	0E+00	3E-07	4E-14	4E-13
22. I129	3E-31	1E-03	8E-03	3E-03	2E-02	1E-03	2E-02	4E-02	1E-02	5E-01	5E+00	3E-01	0E+00	0E+00	0E+00	0E+00
23. Nb93m	3E+01	7E-01	2E+00	4E-01	1E-01	7E-03	5E-01	3E-01	9E-02	4E+01	4E+01	2E+00	0E+00	0E+00	0E+00	0E+00
24. Ni59	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
25. Ni63	3E+02	1E+02	7E+02	1E+01	3E+02	1E+01	7E+01	3E+00	8E+00	2E+03	2E+03	2E+02	0E+00	0E+00	0E+00	0E+00
26 Np237	5E-04	3E-03	2E-02	6E-03	5E-02	2E-03	6E-02	8E-02	3E-02	3E-02	1E+01	6E-01	0E+00	2E-04	9E-07	9E-06
27. Np239	3E-31	2E-04	1E-02	4E-05	5E-06	2E-04	1E-05	7E-03	2E-03	2E+00	5E-05	5E-02	0E+00	0E+00	0E+00	0E+00
28. Pa231	1E-04	2E-05	5E-05	2E-05	1E-04	2E-05	8E-05	3E-04	8E-05	4E-04	1E-03	1E-04	0E+00	7E-05	1E-11	1E-10
29 Pa233	5E-04	3E-03	2E-02	6E-03	5E-02	2E-03	6E-02	8E-02	3E-02	3E-02	1E+01	6E-01	0E+00	2E-04	9E-07	9E-06
30. Pa234m	7E+00	7E-01	2E+00	3E-01	2E-01	3E-01	2E+00	8E+00	2E+00	7E+00	4E-01	6E-01	0E+00	3E+00	0E+00	0E+00
31. Pb209	2E-08	1E-08	2E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	5E-14	5E-13
32. Pb210	3E-10	3E-11	5E-11	2E-11	9E-12	9E-12	6E-11	2E-10	6E-11	5E-10	3E-11	5E-11	0E+00	5E-11	1E-13	1E-12
33 Pb211	3E-05	9E-06	2E-05	1E-05	1E-04	8E-06	4E-05	1E-04	3E-05	2E-04	8E-04	1E-04	0E+00	2E-06	3E-12	3E-11
34 Pb214	2E-09	2E-10	3E-10	7E-11	3E-11	4E-11	2E-10	1E-09	3E-10	2E-09	1E-10	2E-10	0E+00	3E-10	5E-13	6E-12
35. Pd107	4E-31	2E-03	1E-02	3E-03	2E-02	1E-03	3E-02	7E-02	2E-02	9E-01	8E+00	5E-01	0E+00	0E+00	0E+00	0E+00
36 Po210	3E-10	3E-11	5E-11	2E-11	9E-12	8E-12	6E-11	2E-10	6E-11	5E-10	3E-11	5E-11	0E+00	5E-11	1E-13	1E-12

TRAC Database - Tank Farm Summaries for the 241-B Tank Farm

Total (1/1/90)	B-101 Curies	B-102 Curies	B-103 Curies	B-104 Curies	B-105 Curies	B-106 Curies	B-107 Curies	B-108 Curies	B-109 Curies	B-110 Curies	B-111 Curies	B-112 Curies	B-201 Curies	B-202 Curies	B-203 Curies	B-204 Curies
37. Po213	2E-08	1E-08	1E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	5E-14	5E-13
38. Po214	3E-09	3E-10	3E-10	9E-11	4E-11	4E-11	3E-10	1E-09	3E-10	2E-09	1E-10	2E-10	0E+00	3E-10	7E-13	7E-12
39. Po215	3E-05	9E-06	2E-05	1E-05	1E-04	8E-06	4E-05	1E-04	3E-05	2E-04	8E-04	1E-04	0E+00	2E-05	3E-12	3E-11
40. Po218	2E-09	2E-10	3E-10	7E-11	3E-11	4E-11	2E-10	1E-09	3E-10	2E-09	1E-10	2E-10	0E+00	3E-10	5E-13	5E-12
41. Pu238	3E+01	4E+00	5E+00	2E-01	2E-02	4E-03	9E-02	2E-02	1E-02	1E+01	2E-01	1E+00	0E+00	4E+00	5E-03	5E-02
42. Pu239	5E+02	5E+01	2E+02	1E+02	1E+01	1E+00	4E+01	4E+00	5E-01	2E+02	3E+01	4E+00	0E+00	2E+02	7E-01	7E+00
43. Pu240	2E+02	1E+01	5E+01	1E+01	1E+00	1E-01	3E+00	3E-01	4E-02	5E+01	6E+00	6E-01	0E+00	5E+01	1E-01	1E+00
44 Pu241	3E+03	3E+02	6E+02	2E+01	2E+00	2E-01	5E+00	5E-01	5E-02	7E+02	3E+01	3E+00	0E+00	5E+02	8E-01	8E+00
45. Ra223	3E-05	8E-06	2E-05	1E-05	1E-04	8E-06	4E-05	1E-04	3E-05	2E-04	8E-04	1E-04	0E+00	2E-05	3E-12	3E-11
46. Ra225	2E-08	1E-08	2E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	5E-14	5E-13
47. Ra226	2E-09	2E-10	3E-10	7E-11	3E-11	4E-11	2E-10	1E-09	3E-10	2E-09	1E-10	2E-10	0E+00	3E-10	5E-13	5E-12
48. Ru106	4E+00	1E-01	2E-02	3E-08	5E-09	5E-08	1E-07	1E-05	4E-08	1E+00	1E-04	1E-04	0E+00	0E+00	0E+00	0E+00
49. Sb126	8E+00	2E-01	7E-01	6E-02	6E-03	7E-04	6E-02	6E-03	8E-04	1E+01	1E-02	2E-03	0E+00	0E+00	0E+00	0E+00
50. Sb126m	8E+00	2E-01	7E-01	6E-02	6E-03	7E-04	6E-02	6E-03	8E-04	1E+01	1E-02	2E-03	0E+00	0E+00	0E+00	0E+00
51. Se79	5E-30	3E-02	1E-01	5E-02	4E-01	2E-02	4E-01	7E-01	3E-01	8E+00	9E+01	6E+00	0E+00	0E+00	0E+00	0E+00
52. Sm151	7E+03	2E+02	7E+02	1E+02	1E+01	1E+00	2E+02	2E+01	2E+00	1E+04	2E+01	2E+00	0E+00	0E+00	0E+00	0E+00
53. Sn126	7E+00	2E-01	7E-01	6E-02	6E-03	7E-04	6E-02	6E-03	8E-04	1E+01	1E-02	1E-03	0E+00	0E+00	0E+00	0E+00
54. Sr90	5E-26	3E+02	9E+03	8E+03	1E+03	1E+02	2E+04	5E+04	5E+03	6E+04	1E-04	1E+05	0E+00	0E+00	0E+00	0E+00
55 Tc99	2E-28	9E-01	5E+00	2E+00	1E+01	7E-01	1E+01	3E+01	9E+00	3E+02	3E+03	2E+02	0E+00	0E+00	0E+00	0E+00
56. Th227	3E-05	8E-06	2E-05	1E-05	1E-04	8E-06	4E-05	1E-04	3E-05	2E-04	7E-04	9E-05	0E+00	2E-05	3E-12	3E-11
57. Th229	2E-08	1E-08	2E-08	3E-09	2E-08	2E-09	2E-08	2E-08	2E-08	5E-09	1E-06	4E-08	0E+00	7E-11	5E-14	5E-13
58. Th230	6E-07	6E-08	7E-08	1E-08	5E-09	6E-09	4E-08	2E-07	4E-08	3E-07	1E-08	2E-08	0E+00	7E-08	1E-10	1E-09
59. Th231	3E-01	4E-02	8E-02	1E-02	8E-03	1E-02	8E-02	4E-01	9E-02	3E-01	2E-02	2E-02	0E+00	1E-01	2E-08	2E-07
60. Th233	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
61. Th234	7E+00	7E-01	2E+00	3E-01	2E-01	3E-01	2E+00	8E+00	2E+00	7E+00	4E-01	6E-01	0E+00	3E+00	0E+00	0E+00
62. Tl207	3E-05	9E-06	2E-05	1E-05	1E-04	8E-06	4E-05	1E-04	3E-05	2E-04	8E-04	1E-04	0E+00	2E-05	3E-12	3E-11
63. U233	7E-06	6E-06	8E-06	1E-06	1E-05	6E-07	1E-05	1E-05	1E-05	4E-06	1E-03	4E-05	0E+00	3E-08	6E-11	6E-10
64 U234	5E-03	5E-04	6E-04	7E-05	3E-05	3E-05	2E-04	1E-03	2E-04	3E-03	7E-05	2E-04	0E+00	5E-04	6E-07	6E-06
65. U235	3E-01	4E-02	8E-02	1E-02	8E-03	1E-02	9E-02	4E-01	9E-02	3E-01	2E-02	3E-02	0E+00	1E-01	2E-08	2E-07
66. U238	7E+00	8E-01	2E+00	3E-01	2E-01	3E-01	2E+00	8E+00	2E+00	7E+00	4E-01	6E-01	0E+00	3E+00	0E+00	0E+00
67. Y90	6E-26	3E+02	1E+04	8E+03	1E+03	1E+02	2E+04	5E+04	5E+03	6E+04	1E-04	1E+05	0E+00	0E+00	0E+00	0E+00
68. Zr93	4E+01	1E+00	3E+00	4E-01	4E-02	5E-03	4E-01	4E-02	5E-03	6E+01	9E-02	9E-03	0E+00	0E+00	0E+00	0E+00
TOT CURIES	1.13E+04	6.29E+03	4.14E+04	2.52E+04	8 25E+04	4.24E+03	1 31E+05	1.60E+05	3.06E+04	2 63E+05	1.11E+06	6.03E+05	0.00E+00	8.03E+02	1.71E+00	1 71E+01
TOTAL TRU	635 0	65.6	275.2	104.6	20 5	1 8	54 2	19 2	9 6	1374.5	2144 2	128 5	0 0	244 0	0 8	8 1

TRAC Database - Tank Farm Summaries for the 241-B Tank Farm

Total (1/1/90)	B-101 Moles	B-102 Moles	B-103 Moles	B-104 Moles	B-105 Moles	B-106 Moles	B-107 Moles	B-108 Moles	B-109 Moles	B-110 Moles	B-111 Moles	B-112 Moles	B-201 Moles	B-202 Moles	B-203 Moles	B-204 Moles
69 Ag	2E-35	1E-07	6E-07	2E-07	2E-06	9E-08	2E-06	3E-06	1E-08	3E-05	5E-04	2E-05	0E+00	0E+00	0E+00	0E+00
70 Al	1E+03	2E+04	1E+05	7E+04	6E+03	1E+04	3E+05	3E+05	1E+05	3E+05	2E+05	2E+06	0E+00	2E+03	0E+00	0E+00
71 Ba	1E+02	9E+00	6E+00	9E-01	7E+00	5E-01	8E+00	6E+00	6E+00	1E+02	3E+01	6E+01	0E+00	8E-01	0E+00	0E+00
72 Bi	4E-13	3E-13	4E-13	6E+06	6E+05	7E+04	7E+04	7E+03	8E+02	1E+07	4E+06	4E+05	0E+00	7E+01	7E+02	7E+03
73 C2H3O3	0E+00	0E+00	4E+02	0E+00	0E+00	0E+00	0E+00	0E+00	2E-01	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
74 C6H5O7	2E-05	2E+04	3E+04	0E+00	0E+00	1E+04	0E+00	2E+04	7E+03	5E+05	0E+00	2E+05	0E+00	3E+03	0E+00	0E+00
75 CO3	3E+05	1E+05	1E+05	2E+05	1E+06	5E+04	1E+05	7E+04	1E+05	0E+00	2E+06	5E+05	0E+00	0E+00	0E+00	0E+00
76 C2O4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
77 Ca	4E+02	2E+01	2E+00	0E+00	0E+00	5E-04	0E+00	2E-04	1E-01	4E+02	5E-16	1E+02	0E+00	3E+00	0E+00	0E+00
78 Cd	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
79 Ce	9E-31	1E+00	3E+00	7E+01	5E+00	6E-01	3E+01	7E+00	4E+00	0E+00	1E-01	5E+01	0E+00	0E+00	0E+00	0E+00
80 Cl	5E-35	2E-05	3E-05	8E-05	5E-04	2E-05	2E-05	2E-05	7E-06	0E+00	6E-06	1E-04	0E+00	0E+00	0E+00	0E+00
81 Cr	7E+03	3E+02	4E+01	2E+04	2E+03	2E+02	1E+04	1E+03	1E+02	3E+04	8E+03	8E+02	0E+00	9E+01	4E+02	4E+03
82 EDTA	0E+00	0E+00	6E+02	0E+00	0E+00	0E+00	0E+00	0E+00	3E-01	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
83 F	9E-28	4E+02	2E+03	4E+05	8E+05	7E+04	7E+05	2E+06	1E+06	9E-38	1E+02	7E+04	0E+00	5E+04	5E+04	5E+04
84 Fe	8E+04	9E+04	1E+04	3E+05	3E+04	5E+03	2E+05	2E+04	3E+03	6E+05	1E+05	4E+04	0E+00	7E+02	0E+00	0E+00
85 Fe(CN)6	9E+01	1E+01	2E+02	0E+00	0E+00	6E-05	3E+01	8E+01	3E+01	0E+00	8E+01	9E+02	0E+00	0E+00	0E+00	0E+00
86 HEDTA	0E+00	0E+00	1E+03	0E+00	0E+00	0E+00	0E+00	1E+00	1E+00	0E+00	3E+02	9E+00	0E+00	0E+00	0E+00	0E+00
87 Hg	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
88 K	1E-12	1E-03	6E+02	0E+00	0E+00	1E-03	0E+00	7E+02	2E+03	0E+00	3E+04	5E+03	0E+00	4E+04	4E+04	4E+04
89 La	0E+00	0E+00	7E-14	0E+00	0E+00	0E+00	0E+00	0E+00	2E-13	0E+00	0E+00	0E+00	0E+00	3E+01	3E+02	3E+03
90 Mn	6E-08	5E+01	2E+02	0E+00	0E+00	4E+01	0E+00	7E+01	2E+01	1E+03	1E+02	5E+02	0E+00	8E+01	8E+02	8E+03
91 NO2	2E-25	6E+03	4E+04	5E+04	4E+03	3E+03	4E+05	3E+05	1E+05	0E+00	8E+05	2E+06	0E+00	0E+00	0E+00	0E+00
92 NO3	3E-04	2E+05	5E+05	8E+05	3E+06	7E+05	4E+06	4E+06	5E+05	5E+06	2E+07	7E+06	0E+00	3E+05	2E+05	2E+05
93 Na	4E+05	4E+05	7E+05	3E+06	1E+07	6E+06	5E+06	1E+07	8E+06	5E+06	3E+07	6E+06	1E+01	3E+05	3E+05	3E+05
94 Ni	2E+03	1E+03	1E+03	0E+00	0E+00	2E+02	5E-03	4E-02	1E-02	7E+03	1E-02	7E+02	0E+00	5E+01	0E+00	0E+00
95 OH	3E+05	3E+05	2E+05	9E+05	1E+05	2E+04	6E+05	6E+04	3E+04	1E+06	8E+05	2E+05	1E+01	8E+04	1E+05	1E+05
96 PO4	3E-28	9E+03	7E+03	7E+06	2E+06	2E+06	5E+05	1E+06	2E+06	1E+07	4E+06	4E+05	0E+00	5E+03	5E+03	5E+03
97 Pb	2E+04	2E+04	1E+04	4E-10	5E-09	2E-03	1E-09	4E-04	1E-04	5E+00	2E-08	3E-03	0E+00	3E-02	6E-17	6E-16
98 SeO4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
99 SiO3	6E-08	3E+02	2E+03	1E+04	8E+02	2E+02	1E+04	7E+03	3E+03	2E-38	1E+04	6E+04	0E+00	0E+00	0E+00	0E+00
100 Sn	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
101 SO4	2E+04	4E+04	4E+04	7E+04	4E+05	1E+04	3E+04	2E+04	8E+03	5E-08	8E+05	1E+05	0E+00	6E+02	7E+02	7E+02
102 Sr	2E-30	5E-04	6E-01	0E+00	0E+00	4E-04	0E+00	6E+00	2E+00	2E+00	0E+00	4E+01	0E+00	3E-01	0E+00	0E+00
103 WO4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
104 ZrO	4E+00	5E-01	2E+00	7E+03	7E+02	8E+01	2E+04	2E+03	3E+02	9E+00	1E-02	6E+00	0E+00	0E+00	0E+00	0E+00
105 Volume (	1E+02	5E+01	9E+01	4E+02	3E+02	1E+02	2E+02	1E+02	1E+02	6E+02	6E+02	8E+01	3E+01	3E+01	5E+01	5E+01

TRAC Database - Tank Farm Summaries for the 241-BX Tank Farm

Total (1/1/90)	BX-101 Curies	BX-102 Curies	BX-103 Curies	BX-104 Curies	BX-105 Curies	BX-106 Curies	BX-107 Curies	BX-108 Curies	BX-109 Curies	BX-110 Curies	BX-111 Curies	BX-112 Curies
1. Ac225	2E-08	8E-08	3E-08	9E-07	1E-07	3E-07	7E-09	6E-09	2E-08	6E-08	7E-08	6E-09
2. Ac227	3E-05	2E-04	3E-07	8E-04	4E-04	8E-04	3E-05	2E-06	9E-05	1E-04	1E-04	5E-04
3. Am241	1E+02	7E+02	2E-03	2E+01	4E+03	3E+03	3E+00	3E-01	3E+01	6E+01	6E+01	3E+00
4. Am242	3E-05	1E+00	2E-06	8E-03	7E+00	4E+00	4E-05	4E-06	5E-02	1E-01	1E-01	6E-03
5. Am242m	3E-05	1E+00	2E-06	8E-03	7E+00	5E+00	4E-05	4E-06	5E-02	1E-01	1E-01	6E-03
6. Am243	1E-04	6E-01	9E-07	3E-03	3E+00	2E+00	9E-05	9E-06	2E-03	9E-02	9E-02	2E-04
7. At217	2E-08	8E-08	3E-08	9E-07	1E-07	3E-07	7E-09	6E-09	2E-08	6E-08	7E-08	6E-09
8. Ba135m	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
9. Ba137m	8E-15	3E+05	9E-13	6E+05	1E+05	6E+06	1E+04	4E+02	1E+04	4E+05	4E+05	7E+03
10. Bi210	1E-10	6E-11	4E-12	5E-11	2E-10	3E-10	5E-11	8E-12	5E-10	6E-11	5E-11	9E-10
11. Bi211	3E-05	2E-04	3E-07	8E-04	4E-04	8E-04	3E-05	2E-06	9E-05	1E-04	1E-04	5E-04
12. Bi213	2E-08	8E-08	3E-08	1E-06	1E-07	3E-07	7E-09	6E-09	2E-08	8E-08	7E-08	7E-09
13. Bi214	5E-10	1E-10	7E-12	2E-10	6E-10	7E-10	2E-10	3E-11	1E-09	1E-10	1E-10	4E-09
14. C14	2E+01	6E+02	9E+01	1E+03	8E+02	2E+03	2E-01	8E-02	7E+00	1E+02	1E+02	3E+00
15. Cm242	3E-05	1E+00	2E-06	6E-03	6E+00	4E+00	3E-05	3E-06	4E-02	1E-01	1E-01	5E-03
16. Cm244	3E-19	3E+00	7E-20	2E+00	1E+01	1E+01	2E-05	5E-05	1E-03	1E+00	1E+00	7E-04
17. Cm245	2E-23	2E-04	2E-24	4E-05	9E-04	7E-04	3E-10	1E-09	3E-08	7E-05	7E-05	2E-08
18. Cs135	4E-20	1E+00	9E-18	2E+00	4E-01	2E+01	3E-01	2E-03	1E-01	2E+00	2E+00	5E-02
19. Cs137	9E-15	3E+05	9E-13	6E+05	2E+05	6E+06	1E+04	5E+02	2E+04	4E+05	4E+05	7E+03
20. Fr221	2E-08	8E-08	3E-08	1E-06	1E-07	3E-07	7E-09	6E-09	2E-08	6E-08	7E-08	6E-09
21. Fr223	4E-07	3E-06	4E-09	1E-05	6E-06	1E-05	5E-07	3E-08	1E-06	2E-06	2E-06	7E-06
22. I129	1E-19	1E+00	1E-18	5E+00	2E+00	4E+00	8E-03	2E-04	7E-03	5E-01	5E-01	3E-03
23. Nb93m	7E-01	8E+00	5E-08	5E+01	5E+01	5E+01	2E+00	2E-01	2E+01	4E+00	4E+00	3E-01
24. Ni59	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
25. Ni63	4E+02	6E+03	3E+02	1E+03	3E+04	3E+03	5E+01	8E-02	7E+01	2E+01	2E+01	4E+01
26. Np237	6E-04	9E-01	1E-08	1E+01	1E+00	4E+00	2E-02	5E-04	2E-02	9E-01	1E+00	1E-02
27. Np239	1E-04	6E-01	8E-07	3E-03	3E+00	2E+00	9E-05	9E-06	2E-03	8E-02	8E-02	2E-04
28. Pa231	9E-05	4E-04	9E-07	1E-03	8E-04	1E-03	6E-05	5E-06	1E-04	2E-04	2E-04	1E-03
29. Pa233	6E-04	9E-01	1E-08	1E+01	1E+00	4E+00	2E-02	5E-04	2E-02	9E-01	1E+00	1E-02
30. Pa234m	3E+00	4E-02	4E-02	8E-01	5E-02	4E-02	8E-01	1E-01	4E+00	2E-01	1E-01	4E+01
31. Pb209	2E-08	8E-08	3E-08	9E-07	1E-07	3E-07	7E-09	6E-09	2E-08	6E-08	7E-08	6E-09
32. Pb210	9E-11	6E-11	4E-12	5E-11	2E-10	2E-10	5E-11	8E-12	5E-10	5E-11	5E-11	9E-10
33. Pb211	3E-05	2E-04	3E-07	8E-04	4E-04	8E-04	3E-05	2E-06	9E-05	1E-04	1E-04	5E-04
34. Pb214	5E-10	1E-10	7E-12	2E-10	6E-10	7E-10	2E-10	3E-11	1E-09	1E-10	1E-10	4E-09
35. Pd107	2E-19	2E+00	8E-19	9E+00	4E+00	6E+00	7E-03	3E-04	1E-02	8E-01	8E-01	5E-03
36. Po210	9E-11	6E-11	4E-12	5E-11	2E-10	3E-10	5E-11	8E-12	5E-10	6E-11	5E-11	9E-10

TRAC Database - Tank Farm Summaries for the 241-BX Tank Farm

Total (1/1/90)	BX-101 Curies	BX-102 Curies	BX-103 Curies	BX-104 Curies	BX-105 Curies	BX-106 Curies	BX-107 Curies	BX-108 Curies	BX-109 Curies	BX-110 Curies	BX-111 Curies	BX-112 Curies
37. Po213	2E-08	8E-08	3E-08	9E-07	1E-07	3E-07	7E-09	6E-09	2E-08	6E-08	6E-08	6E-09
38. Po214	6E-10	2E-10	8E-12	3E-10	7E-10	9E-10	2E-10	3E-11	2E-09	1E-10	1E-10	5E-09
39. Po215	3E-05	2E-04	3E-07	8E-04	4E-04	8E-04	3E-05	2E-06	9E-05	1E-04	1E-04	5E-04
40. Po218	5E-10	1E-10	7E-12	2E-10	6E-10	7E-10	2E-10	3E-11	1E-09	1E-10	1E-10	4E-09
41. Pu238	1E+01	1E+00	2E-01	2E+00	9E-01	6E-01	1E-01	1E-02	5E-01	1E-01	4E-02	1E-01
42. Pu239	5E+02	3E+01	2E-04	6E+01	3E-03	2E-03	5E+01	5E+00	6E+01	2E+01	2E+00	1E+01
43. Pu240	1E+02	9E+00	3E-04	2E+01	3E-02	3E-02	4E+00	4E-01	7E+00	2E+00	2E-01	2E+00
44. Pu241	3E+03	2E+02	2E-03	2E+02	2E-03	4E-03	1E+01	1E+00	2E+01	7E+00	7E-01	1E+01
45. Ra223	3E-05	2E-04	3E-07	8E-04	4E-04	8E-04	3E-05	2E-06	9E-05	1E-04	1E-04	5E-04
46. Ra225	2E-08	8E-08	3E-08	1E-06	1E-07	3E-07	7E-09	6E-09	2E-08	7E-08	7E-08	6E-09
47. Ra226	5E-10	1E-10	7E-12	2E-10	6E-10	7E-10	2E-10	3E-11	1E-09	1E-10	1E-10	4E-09
48. Ru106	2E-04	6E-04	1E-03	2E-03	5E-03	1E-02	7E-08	7E-09	2E-06	2E-04	2E-04	1E-07
49. Sb126	1E-01	5E-09	3E-08	2E-01	9E-08	6E+00	3E-01	3E-02	3E+00	7E-02	7E-03	6E-02
50. Sb126m	1E-01	5E-09	3E-08	2E-01	9E-08	6E+00	3E-01	3E-02	3E+00	7E-02	7E-03	6E-02
51. Se79	2E-18	2E+01	1E-17	9E+01	4E+01	7E+01	1E-01	3E-03	1E-01	9E+00	9E+00	6E-02
52. Sm151	3E+02	9E-04	4E-03	2E+02	2E-03	7E+03	9E+02	9E+01	7E+03	1E+02	1E+01	7E+01
53. Sn126	1E-01	5E-09	3E-08	2E-01	9E-08	6E+00	3E-01	3E-02	3E+00	7E-02	7E-03	6E-02
54. Sr90	1E-15	1E+05	2E+05	2E+04	4E+06	1E+06	4E+04	5E+03	4E+05	2E+05	2E+05	4E+03
55. Tc99	6E-17	6E+02	4E-16	3E+03	2E+03	2E+03	6E+00	1E-01	4E+00	3E+02	3E+02	2E+00
56. Th227	3E-05	2E-04	2E-07	7E-04	4E-04	8E-04	3E-05	2E-06	8E-05	1E-04	1E-04	6E-04
57. Th229	2E-08	8E-08	3E-08	1E-06	1E-07	3E-07	7E-09	6E-09	2E-08	7E-08	7E-08	6E-09
58. Th230	1E-07	7E-09	2E-09	4E-08	3E-09	1E-08	2E-08	4E-09	2E-07	7E-09	2E-09	7E-07
59. Th231	1E-01	2E-03	2E-03	3E-02	2E-03	2E-03	3E-02	6E-03	2E-01	1E-02	4E-03	2E+00
60. Th233	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
61. Th234	3E+00	4E-02	4E-02	8E-01	5E-02	4E-02	8E-01	1E-01	4E+00	2E-01	1E-01	4E+01
62. Tl207	3E-05	2E-04	3E-07	8E-04	4E-04	8E-04	3E-05	2E-06	9E-05	1E-04	1E-04	5E-04
63. U233	1E-05	8E-05	1E-05	9E-04	1E-04	3E-04	4E-06	2E-06	7E-06	8E-05	8E-05	3E-06
64. U234	1E-03	7E-05	2E-05	3E-04	4E-05	3E-05	1E-04	2E-05	6E-04	4E-05	1E-05	4E-03
65. U235	1E-01	2E-03	2E-03	3E-02	2E-03	2E-03	3E-02	6E-03	2E-01	1E-02	4E-03	2E+00
66. U238	3E+00	4E-02	4E-02	8E-01	5E-02	4E-02	8E-01	1E-01	4E+00	2E-01	1E-01	4E+01
67. Y90	1E-15	1E+05	2E+05	2E+04	4E+06	2E+06	4E+04	5E+03	4E+05	2E+05	2E+05	4E+03
68. Zr93	9E-01	1E-08	6E-08	9E-01	1E-08	9E-10	2E+00	2E-01	2E+01	5E-01	5E-02	4E-01
TOT CURIES	4.44E+03	8.48E+05	4.00E+05	1.25E+06	8.50E+06	1.52E+07	1.01E+05	1.10E+04	8.47E+05	1.22E+06	1.20E+06	2.23E+04
TOTAL TRU	630.0	1345.4	90.2	1092.0	4827.9	4721.6	53.3	5.4	97.7	183.5	163.7	16.1

TRAC Database - Tank Farm Summaries for the 241-BX Tank Farm

Total (1/1/90)	BX-101 Moles	BX-102 Moles	BX-103 Moles	BX-104 Moles	BX-105 Moles	BX-106 Moles	BX-107 Moles	BX-108 Moles	BX-109 Moles	BX-110 Moles	BX-111 Moles	BX-112 Moles
69. Ag	1E-23	8E-05	5E-23	5E-04	2E-04	5E-04	6E-07	2E-08	6E-07	4E-05	4E-05	3E-07
70. Al	1E+06	7E+06	4E+06	5E+05	2E+06	1E+07	1E+05	3E+05	4E+05	3E+06	3E+06	3E+05
71. Ba	3E+00	1E+01	5E+00	3E+01	1E+01	2E+02	3E+00	2E+00	1E+01	2E+01	2E+01	2E+00
72. Bi	5E-13	4E-12	6E-13	1E-11	2E-04	5E-12	7E+04	7E+03	8E+02	5E+04	5E+03	3E+04
73. C2H3O3	0E+00	0E+00	0E+00	0E+00	0E+00	4E+03	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
74. C6H5O7	6E-13	5E+05	3E-14	0E+00	1E+06	1E+06	0E+00	0E+00	0E+00	3E+05	3E+05	0E+00
75. CO3	1E+05	8E+05	1E+06	3E+06	4E+05	3E+06	7E+05	4E+03	3E+05	8E+05	9E+05	7E+04
76. C2O4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
77. Ca	4E+03	4E+02	5E+01	0E+00	1E+00	9E-01	0E+00	1E-07	1E-04	2E-03	4E-03	0E+00
78. Cd	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
79. Ce	7E-20	3E+01	3E-17	2E-03	2E+01	6E+02	1E+02	3E-01	2E-02	7E+01	7E+01	6E+01
80. Cl	2E-24	1E-04	3E-29	1E-07	2E-05	5E-04	2E-04	4E-07	6E-05	2E-04	2E-04	2E-05
81. Cr	3E-01	2E-02	3E-08	2E-05	2E-05	5E+00	1E+04	1E+03	1E+02	7E+03	7E+02	4E+03
82. EDTA	0E+00	0E+00	0E+00	0E+00	0E+00	6E+03	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
83. F	4E-15	7E+04	9E+05	1E+00	6E+04	5E+05	1E+05	2E+04	1E+01	1E+05	1E+05	5E+04
84. Fe	1E+05	1E+05	1E+03	0E+00	2E+05	2E+05	2E+05	2E+04	2E+03	1E+05	5E+04	6E+04
85. Fe(CN)6	2E+01	3E+03	6E+02	9E+00	6E+00	1E+03	0E+00	5E-02	3E+01	1E+03	1E+03	2E-14
86. HEDTA	9E-18	6E+01	5E-23	3E+02	7E+01	1E+04	0E+00	0E+00	0E+00	1E+01	1E+01	0E+00
87. Hg	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
88. K	6E-18	1E+04	3E-21	3E+04	8E+04	4E+05	0E+00	0E+00	0E+00	8E+03	8E+03	0E+00
89. La	0E+00	0E+00	0E+00	0E+00	0E+00	3E-24	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
90. Mn	2E-15	2E+03	3E+02	2E+02	4E+03	7E+03	0E+00	0E+00	0E+00	8E+02	9E+02	0E+00
91. NO2	2E-14	2E+06	3E-11	9E+05	2E+05	7E+06	8E+04	8E+03	2E+05	3E+06	3E+06	1E+05
92. NO3	9E-04	2E+07	5E+07	5E+07	4E+07	1E+08	1E+06	2E+04	1E+06	1E+07	1E+07	1E+06
93. Na	2E+05	2E+07	6E+07	6E+07	5E+07	1E+08	4E+06	4E+04	1E+06	8E+06	9E+06	2E+06
94. Ni	1E+04	2E+04	1E+03	2E+01	4E+04	8E+03	0E+00	6E-13	6E-03	5E-01	5E-01	2E-26
95. OH	4E+06	1E+07	1E+07	3E+06	4E+06	7E+06	6E+05	1E+06	9E+05	1E+06	4E+04	9E+05
96. PO4	2E-15	2E+04	4E+04	7E+03	2E+05	1E+06	4E+05	8E+03	4E+04	1E+05	3E+05	5E+05
97. Pb	9E+03	1E+04	1E+03	2E-08	8E-02	2E+04	1E-09	6E-11	3E-09	5E-03	5E-03	1E-08
98. SeO4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
99. SiO3	2E-14	2E+06	1E+05	2E+04	5E+04	4E+05	2E+04	2E+02	4E+03	8E+04	8E+04	1E+04
100. Sn	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
101. SO4	2E+03	2E+05	2E+05	1E+06	3E+05	2E+06	2E+05	4E+02	4E+04	2E+05	2E+05	3E+04
102. Sr	9E-21	3E+02	4E+02	1E+02	1E+03	2E+02	0E+00	0E+00	2E-03	7E+01	7E+01	0E+00
103. WO4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
104. ZrO	3E+00	9E+00	2E+01	4E+00	1E+02	6E+01	2E+04	2E+03	3E+02	2E+04	2E+03	9E+03
105. Volume (	5E+01	6E+01	8E+02	5E+02	5E+02	1E+03	4E+02	2E+01	2E+02	2E+02	2E+02	1E+02

TRAC Database - Tank Farm Summaries for the 241-BY Tank Farm

Total (1/1/90)	BY-101 Curies	BY-102 Curies	BY-103 Curies	BY-104 Curies	BY-105 Curies	BY-106 Curies	BY-107 Curies	BY-108 Curies	BY-109 Curies	BY-110 Curies	BY-111 Curies	BY-112 Curies
1 Ac225	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
2 Ac227	2E-04	5E-05	4E-05	8E-04	3E-04	2E-04	1E-04	9E-05	6E-05	2E-04	2E-04	3E-05
3 Am241	8E+01	2E+01	2E+02	2E+02	2E+02	1E+02	6E+01	9E+01	3E+01	1E+02	8E+01	1E+01
4 Am242	2E-01	5E-02	3E-02	3E-01	2E-01	2E-01	8E-02	1E-01	6E-02	2E-01	2E-01	3E-02
5 Am242m	2E-01	5E-02	3E-02	3E-01	2E-01	2E-01	8E-02	1E-01	6E-02	2E-01	2E-01	3E-02
6 Am243	1E-01	3E-02	1E-02	2E-01	1E-01	1E-01	6E-02	9E-02	4E-02	1E-01	1E-01	2E-02
7 At217	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
8 Ba135m	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
9 Ba137m	5E+05	1E+05	2E+04	5E+05	4E+05	5E+05	2E+05	2E+05	2E+05	4E+05	5E+05	9E+04
10 Bi210	9E-11	4E-11	2E-10	2E-09	1E-09	3E-10	3E-10	2E-10	2E-11	4E-10	9E-11	1E-11
11 Bi211	2E-04	5E-05	4E-05	8E-04	3E-04	2E-04	1E-04	9E-05	6E-05	2E-04	2E-04	3E-05
12 Bi213	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
13 Bi214	1E-10	1E-10	9E-10	9E-09	4E-09	1E-09	1E-09	1E-09	6E-11	1E-09	2E-10	3E-11
14 C14	2E+02	5E+01	1E+01	2E+02	1E+02	2E+02	6E+01	6E+01	5E+01	1E+02	2E+02	3E+01
15 Cm242	1E-01	4E-02	2E-02	3E-01	2E-01	1E-01	6E-02	1E-01	5E-02	1E-01	2E-01	3E-02
16 Cm244	2E+00	4E-01	8E-02	2E+00	1E+00	2E+00	6E-01	9E-01	5E-01	1E+00	2E+00	3E-01
17 Cm245	9E-05	3E-05	5E-06	1E-04	8E-05	1E-04	4E-05	6E-05	3E-05	9E-05	1E-04	2E-05
18 Cs135	2E+00	6E-01	1E-01	2E+00	2E+00	2E+00	7E-01	1E+00	7E-01	2E+00	2E+00	4E-01
19 Cs137	5E+05	1E+05	2E+04	5E+05	4E+05	5E+05	2E+05	2E+05	2E+05	5E+05	5E+05	9E+04
20 Fr221	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
21 Fr223	3E-06	7E-07	6E-07	1E-05	5E-06	3E-06	2E-06	1E-06	8E-07	2E-06	3E-06	5E-07
22 I129	6E-01	2E-01	3E-02	7E-01	5E-01	6E-01	2E-01	3E-01	2E-01	6E-01	7E-01	1E-01
23 Nb93m	5E+00	1E+00	2E+00	4E+01	2E+01	1E+01	8E+00	8E+00	2E+00	1E+01	5E+00	9E-01
24 Ni59	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
25 Ni63	5E+02	7E+02	3E+03	2E+03	2E+03	3E+02	7E+02	1E+03	5E+02	1E+03	6E+02	9E+02
26 Np237	1E+00	4E-01	6E-02	1E+00	1E+00	1E+00	5E-01	7E-01	4E-01	1E+00	1E+00	2E-01
27 Np239	1E-01	3E-02	1E-02	2E-01	1E-01	1E-01	5E-02	9E-02	3E-02	1E-01	1E-01	2E-02
28 Pa231	3E-04	9E-05	1E-04	1E-03	7E-04	3E-04	3E-04	1E-04	1E-04	3E-04	3E-04	5E-05
29 Pa233	1E+00	4E-01	6E-02	1E+00	1E+00	1E+00	5E-01	7E-01	4E-01	1E+00	1E+00	2E-01
30 Pa234m	5E-02	4E-01	5E+00	5E+01	2E+01	2E-01	5E+00	9E-01	3E-01	6E-02	1E+00	5E-02
31 Pb209	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
32 Pb210	9E-11	4E-11	2E-10	2E-09	1E-09	3E-10	3E-10	2E-10	2E-11	3E-10	9E-11	1E-11
33 Pb211	2E-04	5E-05	4E-05	8E-04	3E-04	2E-04	1E-04	9E-05	6E-05	2E-04	2E-04	3E-05
34 Pb214	1E-10	1E-10	9E-10	9E-09	4E-09	1E-09	1E-09	1E-09	6E-11	1E-09	2E-10	3E-11
35 Pd107	1E+00	3E-01	5E-02	1E+00	9E-01	1E+00	4E-01	5E-01	3E-01	1E+00	1E+00	2E-01
36 Po210	9E-11	4E-11	2E-10	2E-09	1E-09	3E-10	3E-10	2E-10	2E-11	3E-10	9E-11	1E-11

TRAC Database - Tank Farm Summaries for the 241-BY Tank Farm

Total (1/1/90)	BY-101 Curies	BY-102 Curies	BY-103 Curies	BY-104 Curies	BY-105 Curies	BY-106 Curies	BY-107 Curies	BY-108 Curies	BY-109 Curies	BY-110 Curies	BY-111 Curies	BY-112 Curies
37. Po213	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
38. Po214	2E-10	1E-10	1E-09	1E-08	5E-09	1E-09	2E-09	1E-09	7E-11	2E-09	4E-10	5E-11
39. Po215	2E-04	5E-05	4E-05	8E-04	3E-04	2E-04	1E-04	9E-05	6E-05	2E-04	2E-04	3E-05
40. Po218	1E-10	1E-10	9E-10	9E-09	4E-09	1E-09	1E-09	1E-09	6E-11	1E-09	2E-10	3E-11
41. Pu238	1E-01	2E-01	2E+01	4E+01	1E+01	1E+01	7E+00	1E+01	1E-01	1E+01	1E-01	1E-01
42. Pu239	4E-02	4E-03	9E+02	2E+02	9E+01	3E+01	3E+01	3E+01	8E-05	5E+01	2E-01	1E-04
43. Pu240	1E-02	2E-03	2E+02	3E+01	2E+01	6E+00	6E+00	6E+00	2E-03	1E+01	5E-02	2E-03
44. Pu241	2E-02	2E-03	3E+03	1E+02	8E+01	4E+01	3E+01	4E+01	4E-04	6E+01	3E-01	8E-04
45. Ra223	2E-04	5E-05	4E-05	8E-04	3E-04	2E-04	1E-04	9E-05	6E-05	2E-04	2E-04	3E-05
46. Ra225	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
47. Ra226	1E-10	1E-10	9E-10	9E-09	4E-09	1E-09	1E-09	1E-09	6E-11	1E-09	2E-10	3E-11
48. Ru106	2E-04	8E-05	2E-02	3E-04	3E-04	2E-04	9E-05	1E-04	7E-05	2E-04	2E-04	4E-05
49. Sb126	2E-03	2E-04	6E-01	6E+00	5E+00	1E+00	1E+00	2E+00	2E-08	2E+00	1E-02	1E-08
50. Sb126m	2E-03	2E-04	6E-01	6E+00	5E+00	1E+00	1E+00	2E+00	2E-08	2E+00	1E-02	1E-08
51. Se79	1E+01	3E+00	6E-01	1E+01	1E+01	1E+01	4E+00	5E+00	4E+00	1E+01	1E+01	2E+00
52. Sm151	4E+00	4E-01	6E+02	9E+03	6E+03	2E+03	2E+03	2E+03	1E-03	3E+03	1E+01	1E-03
53. Sn126	2E-03	2E-04	5E-01	6E+00	4E+00	1E+00	1E+00	1E+00	2E-08	2E+00	1E-02	1E-08
54. Sr90	4E+05	1E+05	7E+05	3E+05	2E+05	4E+05	2E+05	5E+04	1E+05	3E+05	4E+05	7E+04
55. Tc99	4E+02	1E+02	2E+01	4E+02	3E+02	4E+02	2E+02	2E+02	1E+02	4E+02	4E+02	8E+01
56. Th227	2E-04	5E-05	4E-05	7E-04	3E-04	2E-04	1E-04	9E-05	6E-05	2E-04	2E-04	3E-05
57. Th229	1E-07	5E-08	8E-08	1E-07	1E-07	1E-07	7E-08	7E-08	5E-08	1E-07	1E-07	6E-08
58. Th230	2E-09	2E-08	2E-07	2E-06	6E-07	2E-07	2E-07	2E-07	4E-09	2E-07	2E-08	3E-09
59. Th231	2E-03	2E-02	2E-01	2E+00	8E-01	1E-02	2E-01	4E-02	1E-02	3E-03	5E-02	2E-03
60. Th233	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
61. Th234	5E-02	4E-01	5E+00	5E+01	2E+01	2E-01	5E+00	9E-01	3E-01	6E-02	1E+00	5E-02
62. Tl207	2E-04	5E-05	4E-05	8E-04	3E-04	2E-04	1E-04	9E-05	6E-05	2E-04	2E-04	3E-05
63. U233	1E-04	4E-05	4E-05	1E-04	1E-04	1E-04	6E-05	7E-05	5E-05	1E-04	1E-04	5E-05
64. U234	2E-05	1E-04	2E-03	1E-02	3E-03	1E-03	1E-03	1E-03	4E-05	1E-03	1E-04	2E-05
65. U235	2E-03	2E-02	2E-01	2E+00	8E-01	1E-02	2E-01	4E-02	1E-02	3E-03	5E-02	2E-03
66. U238	5E-02	4E-01	5E+00	5E+01	2E+01	2E-01	5E+00	9E-01	3E-01	6E-02	1E+00	5E-02
67. Y90	4E+05	1E+05	7E+05	3E+05	2E+05	4E+05	2E+05	5E+04	1E+05	4E+05	4E+05	7E+04
68. Zr93	1E-02	1E-03	3E+00	4E+01	3E+01	9E+00	7E+00	9E+00	0E+00	1E+01	8E-02	1E-08
TOT CURIES	1.72E+06	4.81E+05	1.47E+06	1.61E+06	1.23E+06	1.76E+06	7.03E+05	5.03E+05	6.01E+05	1.56E+06	1.70E+06	3.21E+05
TOTAL TRU	281.9	70.8	1137.2	626.2	359.8	361.8	157.9	191.7	80.7	281.8	284.3	40.4

TRAC Database - Tank Farm Summaries for the 241-BY Tank Farm

Total (1/1/90)	BY-101 Moles	BY-102 Moles	BY-103 Moles	BY-104 Moles	BY-105 Moles	BY-106 Moles	BY-107 Moles	BY-108 Moles	BY-109 Moles	BY-110 Moles	BY-111 Moles	BY-112 Moles
69 Ag	5E-05	1E-05	2E-06	5E-05	4E-05	5E-05	2E-05	3E-05	2E-05	5E-05	5E-05	1E-05
70 Al	4E+06	2E+06	4E+06	4E+06	5E+06	5E+06	2E+08	2E+08	2E+08	4E+08	5E+08	4E+08
71 Ba	4E+01	1E+01	2E+01	4E+01	3E+01	3E+01	1E+01	2E+01	1E+01	3E+01	3E+01	1E+01
72 Bi	2E-12	2E-12	4E-04	5E+04	3E+04	1E-06	1E+04	1E+03	1E-05	1E+04	4E-12	9E-05
73 C2H3O3	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
74 C6H5O7	3E+05	1E+05	2E+04	4E+05	3E+05	3E+05	1E+05	2E+05	1E+05	3E+05	4E+05	6E+04
75 CO3	1E+06	3E+05	1E+05	3E+06	2E+06	1E+06	6E+05	7E+05	4E+05	1E+06	1E+06	2E+05
76 C2O4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
77 Ca	5E-03	2E-02	4E-01	7E+04	1E+05	2E+04	7E+03	1E+04	2E-02	1E+04	4E-03	8E-03
78 Cd	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
79 Ce	9E+01	3E+01	5E+00	1E+02	7E+01	1E+02	3E+01	5E+01	3E+01	9E+01	1E+02	2E+01
80 Cl	3E-04	8E-05	1E-05	3E-04	2E-04	3E-04	1E-04	2E-04	9E-05	2E-04	3E-04	5E-05
81 Cr	6E-13	2E-12	5E-05	6E+03	5E+03	1E-07	2E+03	2E+02	1E-06	2E+03	1E-12	1E-05
82 EDTA	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
83 F	1E+05	1E+06	4E+06	1E+05	1E+05	1E+05	5E+04	9E+04	2E+05	1E+05	1E+05	4E+04
84 Fe	6E+04	2E+04	3E+03	2E+05	1E+05	6E+04	5E+04	4E+04	2E+04	8E+04	6E+04	1E+04
85 Fe(CN)6	1E+03	4E+02	2E+03	1E+05	7E+04	3E+04	3E+04	3E+04	4E+02	5E+04	2E+03	2E+03
86 HEDTA	2E+01	5E+00	9E-01	2E+01	1E+01	2E+01	7E+00	1E+01	6E+00	2E+01	2E+01	3E+00
87 Hg	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
88 K	1E+04	3E+03	5E+02	1E+04	8E+03	1E+04	4E+03	7E+03	3E+03	1E+04	1E+04	2E+03
89 La	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
90 Mn	1E+03	3E+02	6E+01	1E+03	9E+02	1E+03	4E+02	7E+02	4E+02	1E+03	1E+03	2E+02
91 NO2	4E+06	1E+06	2E+05	4E+06	3E+06	4E+06	2E+08	2E+06	1E+06	4E+06	4E+06	8E+05
92 NO3	2E+07	3E+07	8E+07	2E+07	1E+07	2E+07	6E+06	9E+06	3E+07	1E+07	2E+07	1E+07
93 Na	2E+07	3E+07	9E+07	1E+07	1E+07	1E+07	4E+08	8E+06	3E+07	1E+07	1E+07	1E+07
94 Ni	3E+00	1E+02	3E+03	2E+05	1E+05	6E+04	6E+04	6E+04	2E+02	9E+04	3E+03	4E+03
95 OH	1E+06	5E+06	1E+07	5E+05	7E+06	4E+06	2E+06	4E+05	4E+06	3E+05	2E+06	3E+06
96 PO4	5E+05	2E+04	1E+06	7E+04	1E+05	6E+04	3E+04	4E+04	2E+04	6E+04	6E+04	5E+04
97 Pb	2E-02	1E+00	2E+03	7E-03	7E-03	7E-03	3E-03	5E-03	9E-01	6E-03	7E-03	1E-03
98 SeO4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
99 SiO3	1E+05	3E+04	6E+03	1E+05	1E+05	1E+05	4E+04	6E+04	4E+04	1E+05	1E+05	2E+04
100 Sn	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
101 SO4	3E+05	8E+04	8E+04	3E+05	2E+05	3E+05	1E+05	1E+05	9E+04	3E+05	3E+05	5E+04
102 Sr	9E+01	5E+03	6E+04	9E+01	3E+03	3E+04	2E+04	1E+03	3E+03	3E+04	2E+03	8E+03
103 WO4	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00	0E+00
104 ZrO	2E+01	8E+00	4E+01	2E+04	1E+04	2E+01	4E+03	4E+02	5E+00	4E+03	2E+01	5E+00
105 Volume (	4E+02	4E+02	1E+03	7E+02	6E+02	6E+02	3E+02	3E+02	5E+02	6E+02	6E+02	3E+02

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